

**Fishery Management Report for the Recreational,
Personal Use, and Subsistence Fisheries of the Upper
Copper/Upper Susitna River Management Area, 2019**

by

Mark A. Somerville

and

Tracy R. Hansen

July 2021

Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the following reports by the Divisions of Sport Fish and of Commercial Fisheries: Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

Weights and measures (metric)		General		Mathematics, statistics	
centimeter	cm	Alaska Administrative Code		all standard mathematical signs, symbols and abbreviations	
deciliter	dL		AAC		
gram	g	all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.	alternate hypothesis	H _A
hectare	ha			base of natural logarithm	e
kilogram	kg	all commonly accepted		catch per unit effort	CPUE
kilometer	km	professional titles	e.g., Dr., Ph.D., R.N., etc.	coefficient of variation	CV
liter	L			common test statistics	(F, t, χ^2 , etc.)
meter	m	at	@	confidence interval	CI
milliliter	mL	compass directions:		correlation coefficient (multiple)	R
millimeter	mm	east	E	correlation coefficient (simple)	r
Weights and measures (English)		north	N	covariance	cov
cubic feet per second	ft ³ /s	south	S	degree (angular)	°
foot	ft	west	W	degrees of freedom	df
gallon	gal	copyright	©	expected value	E
inch	in	corporate suffixes:		greater than	>
mile	mi	Company	Co.	greater than or equal to	≥
nautical mile	nmi	Corporation	Corp.	harvest per unit effort	HPUE
ounce	oz	Incorporated	Inc.	less than	<
pound	lb	Limited	Ltd.	less than or equal to	≤
quart	qt	District of Columbia	D.C.	logarithm (natural)	ln
yard	yd	et alii (and others)	et al.	logarithm (base 10)	log
Time and temperature		et cetera (and so forth)	etc.	logarithm (specify base)	log ₂ , etc.
day	d	exempli gratia (for example)	e.g.	minute (angular)	'
degrees Celsius	°C	Federal Information Code	FIC	not significant	NS
degrees Fahrenheit	°F	id est (that is)	i.e.	null hypothesis	H ₀
degrees kelvin	K	latitude or longitude	lat or long	percent	%
hour	h	monetary symbols (U.S.)	\$, ¢	probability	P
minute	min	months (tables and figures): first three letters	Jan,...,Dec	probability of a type I error (rejection of the null hypothesis when true)	α
second	s	registered trademark	®	probability of a type II error (acceptance of the null hypothesis when false)	β
Physics and chemistry		trademark	™	second (angular)	"
all atomic symbols		United States (adjective)	U.S.	standard deviation	SD
alternating current	AC	United States of America (noun)	USA	standard error	SE
ampere	A	U.S.C.	United States Code	variance	
calorie	cal			population sample	Var var
direct current	DC	U.S. state	use two-letter abbreviations (e.g., AK, WA)		
hertz	Hz				
horsepower	hp				
hydrogen ion activity (negative log of)	pH				
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

FISHERY MANAGEMENT REPORT NO. 21-07

**FISHERY MANAGEMENT REPORT FOR THE RECREATIONAL,
PERSONAL USE, AND SUBSISTENCE FISHERIES OF THE UPPER
COPPER/UPPER SUSITNA MANAGEMENT AREA, 2019**

by
Mark A. Somerville
Alaska Department of Fish and Game, Division of Sport Fish, Glennallen
and
Tracy R. Hansen
Alaska Department of Fish and Game, Division of Sport Fish, Glennallen

Alaska Department of Fish and Game
Division of Sport Fish, Research and Technical Services
333 Raspberry Road, Anchorage, Alaska, 99518-1565

July 2021

The Fishery Management Reports series was established in 1989 by the Division of Sport Fish for the publication of an overview of management activities and goals in a specific geographic area, and became a joint divisional series in 2004 with the Division of Commercial Fisheries. Fishery Management Reports are intended for fishery and other technical professionals, as well as lay persons. Fishery Management Reports are available through the Alaska State Library and on the Internet: <http://www.adfg.alaska.gov/sf/publications/>. This publication has undergone regional peer review.

Product names used in this publication are included for completeness and do not constitute product endorsement. The Alaska Department of Fish and Game does not endorse or recommend any specific company or their products.

*Mark A. Somerville,
Alaska Department of Fish and Game, Division of Sport Fish,
P.O. Box 47, Glennallen, AK 99588-0047, USA*

and

*Tracy R. Hansen
Alaska Department of Fish and Game, Division of Sport Fish,
P.O. Box 47, Glennallen, AK 99588-0047, USA*

This document should be cited as follows:

Somerville, M. A., and T. R. Hansen. 2021. Fishery management report for the recreational, personal use, and subsistence fisheries of the Upper Copper/Upper Susitna Management Area, 2019. Alaska Department of Fish and Game, Fishery Management Report No. 21-07, Anchorage.

The Alaska Department of Fish and Game (ADF&G) administers all programs and activities free from discrimination based on race, color, national origin, age, sex, religion, marital status, pregnancy, parenthood, or disability. The department administers all programs and activities in compliance with Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Title II of the Americans with Disabilities Act (ADA) of 1990, the Age Discrimination Act of 1975, and Title IX of the Education Amendments of 1972.

If you believe you have been discriminated against in any program, activity, or facility please write:

ADF&G ADA Coordinator, P.O. Box 115526, Juneau, AK 99811-5526

U.S. Fish and Wildlife Service, 4401 N. Fairfax Drive, MS 2042, Arlington, VA 22203

Office of Equal Opportunity, U.S. Department of the Interior, 1849 C Street NW MS 5230, Washington DC 20240

The department's ADA Coordinator can be reached via phone at the following numbers:

(VOICE) 907-465-6077, (Statewide Telecommunication Device for the Deaf) 1-800-478-3648,

(Juneau TDD) 907-465-3646, or (FAX) 907-465-6078

For information on alternative formats and questions on this publication, please contact:

ADF&G Division of Sport Fish, Research and Technical Services, 333 Raspberry Road, Anchorage AK 99518 (907) 267-2375

TABLE OF CONTENTS

	Page
LIST OF TABLES.....	ii
LIST OF FIGURES	ii
LIST OF APPENDICES	ii
ABSTRACT	1
INTRODUCTION	1
Management Area Overview	1
Recent Board of Fisheries Actions	4
FISHERY DESCRIPTIONS	4
King Salmon Sport Fisheries	4
Gulkana River King Salmon Sport Fishery	7
Klutina River King Salmon Sport Fishery	10
Other Copper River Basin King Salmon Sport Fisheries.....	13
Sockeye Salmon Sport Fisheries	13
Coho Salmon Sport Fisheries	17
Wild Arctic Grayling Sport Fisheries	17
Lake Trout Sport Fisheries	19
Wild Rainbow and Steelhead Trout Sport Fisheries.....	21
Upper Copper River Personal Use Fishery	23
Upper Copper River Salmon Subsistence Fisheries	28
Upper Copper River Freshwater Finfish Subsistence Fisheries.....	34
ACKNOWLEDGMENTS	37
REFERENCES CITED	37
TABLES	43
FIGURES	63
APPENDIX A: EMERGENCY ORDERS	69
APPENDIX B: FEDERAL SUBSISTENCE PERMITS.....	73

LIST OF TABLES

Table	Page
1. Sport fishing effort in the Upper Copper/Upper Susitna Management Area, Region III, and statewide, 2000–2019.....	44
2. Sport fishing effort in the Upper Copper/Upper Susitna Management Area by drainage, 2000–2019.	45
3. Number of fish harvested, by species, by sport anglers fishing Upper Copper/Upper Susitna Management Area waters, 2000–2019.	46
4. Number of fish caught, by species, by sport anglers fishing Upper Copper/Upper Susitna Management Area waters, 2000–2019.....	47
5. Inseason regulatory action history for the Copper River District commercial and Upper Copper River king salmon fisheries, 2009–2020.	48
6. Harvest of king salmon by sport anglers fishing in the Upper Copper/Upper Susitna Management Area by drainage, 2000–2019.	50
7. Summary of king salmon harvests and upriver escapement in the Copper River, 2000–2019.	51
8. Catch of king salmon by sport anglers fishing in the Upper Copper/Upper Susitna Management Area by drainage, 2000–2019.	52
9. Summary of sockeye harvests and upriver escapement in the Copper River 2000–2019.	53
10. Harvest of sockeye salmon by sport anglers fishing Upper Copper/Upper Susitna Management Area drainages, 2000–2019.....	54
11. Harvest of wild Arctic grayling by sport anglers in the Upper Copper/Upper Susitna Management Area by drainage, 2000–2019.	55
12. Catch of wild Arctic grayling by sport anglers in the Upper Copper/Upper Susitna Management Area by drainage, 2000–2019.	56
13. Harvest of lake trout by sport anglers in the Upper Copper/Upper Susitna Management Area by drainage, 2000–2019.	57
14. Catch of wild rainbow trout by sport anglers fishing Upper Copper/Upper Susitna Management Area waters by drainage, 2000–2019.....	58
15. Number of permits issued and expanded salmon harvests for the Chitina Subdistrict personal use salmon fishery in the Copper River, 2000–2019.	59
16. Number of permits issued and expanded salmon harvests for the Glennallen Subdistrict subsistence salmon fishery in the Copper River, 2000–2019.	60
17. Number of freshwater finfish subsistence permits issued and harvest from Upper Copper/Upper Susitna Management Area waters, 2000–2019.	61

LIST OF FIGURES

Figure	Page
1. The Upper Copper/Upper Susitna Management Area.....	64
2. Upper Copper River fishery subdistricts and areas.	65
3. Gulkana River drainage.....	66
4. Upper Copper Upper Susitna Management Area lake trout and burbot fisheries.	67

LIST OF APPENDICES

Appendix	Page
A1. Emergency orders issued for Upper Copper/Upper Susitna Management Area sport, personal use, and subsistence fisheries during 2019 and 2020.	70
B1. Federal subsistence permits and harvest from the Copper River, Glennallen Subdistrict, 2002–2019.	74
B2. Federal subsistence permits and harvest from the Copper River, Chitina Subdistrict, 2002–2019.....	75

ABSTRACT

Season summaries for the sport, personal use, and subsistence fisheries in the Upper Copper/Upper Susitna Management Area for 2019 and preliminary information for 2020 are presented. The area's king (Chinook), sockeye, and coho salmon were targeted in sport, personal use, and subsistence fisheries, and other resident fishes such as burbot, lake trout, rainbow/steelhead trout, Arctic grayling, and Dolly Varden were targeted in year-round sport fisheries. Subsistence fisheries for resident species also occurred and primarily targeted whitefish. In 2019, sport angler effort was estimated at 37,048 angler-days, which was the highest amount of effort expended in the management area over the past 5 years. Estimated sport catch totaled 75,147 fish and sport harvest totaled 15,503 fish, with sockeye salmon accounting for 47% of the harvest. The Chitina Subdistrict personal use fishery harvested 175,487 salmon, which was the third highest harvest since 2000, and the Glennallen Subdistrict subsistence fishery harvested a total of 63,920 salmon, which was near the recent 10-year average. Inriver abundance of both sockeye and king salmon were above the recent 10-year averages in 2019, and the escapement goals were achieved for both species. No restrictions on salmon were enacted in the sport, personal use, or subsistence fisheries in 2019, and the sockeye salmon sport fishery was even liberalized. The 2020 sockeye and king salmon returns to the Copper River were weak and restrictions were enacted in the Upper Copper River sport and personal use fisheries to help safeguard for adequate spawning escapements. The sockeye salmon sport fishery was closed for a portion of the 2020 season and the king salmon sport fishery was reduced to a 1 fish annual limit. The personal use fishery was restricted for much of June and July, was closed for all of August, and king salmon retention was prohibited for the majority of the season. No restrictions were placed on the subsistence fishery.

Keywords: Copper River, Susitna River, Klutina River, Gulkana River, Chitina Subdistrict, Glennallen Subdistrict, personal use, subsistence, king (Chinook) salmon, sockeye salmon, burbot, lake trout, Arctic grayling, sport fish, fisheries management

INTRODUCTION

This fisheries management report provides information on the sport, personal use, and subsistence fisheries within the Upper Copper/Upper Susitna Management Area (UCUSMA). The report is provided for the Alaska Board of Fisheries (BOF), Fish and Game Advisory Committees (ACs), the general public, and other interested parties. This report is designed to present the current status of sport, personal use, and subsistence fisheries in the area including brief synopsis of current trends and outlooks that are relevant to proposals submitted to the BOF during the 2021 Prince William Sound regulatory meeting.

This fisheries management report provides information regarding the UCUSMA fisheries for 2019, with preliminary information from the 2020 season. The report is organized into sections covering the description of the management area, recent BOF actions, specific fishery descriptions with background and historical references, recent fishery performance, current issues and fishery outlooks, and recent BOF actions and current proposals by fishery.

MANAGEMENT AREA OVERVIEW

The UCUSMA consists of all waters and drainages of the Copper River upstream of Haley Creek in Wood Canyon, and all waters and drainages of the Upper Susitna River upstream from the confluence of the Oshetna River (Figure 1). Located within the UCUSMA are the communities of Glennallen, Gulkana, Gakona, Copper Center, Kenny Lake, Chitina, McCarthy, Chistochina, Paxson, Mentasta, and Slana. Three of the state's major highways (Glenn, Richardson, and Edgerton), together with numerous secondary roads and trails, provide access to most of the area's sport fisheries. Float-equipped aircraft are commonly used during the summer to access the area's many remote lake and stream fisheries, and snowmachines are the popular mode of travel to remote fisheries during winter. Principal land managers in the UCUSMA are the National Park Service

(Wrangell–St. Elias National Park), Bureau of Land Management (Gulkana Wild River), Ahtna Incorporated, Chitina Native Corporation, and the Alaska Department of Natural Resources.

The UCUSMA offers a variety of freshwater fishing opportunities. Three species of Pacific salmon (king or Chinook *Oncorhynchus tshawytscha*, sockeye *O. nerka*, and coho *O. kisutch*) are available to anglers fishing the Upper Copper River drainage; however, no anadromous runs of salmon return to the Upper Susitna River drainage and waters upstream of the Oshetna River confluence are closed to salmon fishing. Resident stocks of Arctic grayling (*Thymallus arcticus*), burbot (*Lota lota*), Dolly Varden (*Salvelinus malma*), rainbow and steelhead trout (*O. mykiss*), lake trout (*S. namaycush*), and whitefish (*Coregonus* spp.) are present in many UCUSMA waters and are targeted by fishermen. Additionally, rainbow trout, coho salmon, Arctic grayling, and Arctic char (*S. alpinus*) reared at the state-owned Ruth Burnett Hatchery in Fairbanks and the William Jack Hernandez Hatchery in Anchorage are stocked in several lakes across the UCUSMA. Stocked-lake fisheries provide additional, diversified angling opportunities and reduce harvest pressure on wild fish stocks.

Sport fisheries in Alaska are monitored through the Alaska Sport Fishing Survey (commonly known as the statewide harvest survey or SWHS). Effort, harvest, and catch statistics for UCUSMA sport fisheries have been estimated from responses to the SWHS since 1977 and reported under the headings of the “Upper Copper River Drainage” (Area I) and the “Susitna River Drainage” (Area M) in annual versions of Alaska Statewide Sport Fish Harvest Studies; Participation, Catch, and Harvest in Alaska Sport Fisheries; and Estimates of Participation, Catch, and Harvest in Alaska, accessible through the ADF&G e-Library (<http://www.adfg.alaska.gov/sf/publications/>).

Angler effort in the UCUSMA makes up only a small percentage of the sport fishing effort statewide but does compose approximately 20% of the sport fishing effort in Region III (Table 1). In the UCUSMA, angler effort peaked in the early-to-mid 1990s but generally remained between 40,000 and 60,000 angler-days until 2013 (Somerville 2017). Since 2013, angler effort has been below 40,000 angler-days annually. The decline in sport angler effort in the UCUSMA mimics similar declines in Region III and statewide. Most of the effort in the UCUSMA occurs in the Gulkana and Klutina River drainages (Table 2).

A total of 37,048 angler-days of effort in UCUSMA waters occurred in 2019 (Table 1), which was the highest amount of effort expended in the management area over the past five years. Most effort was directed in the Gulkana and Klutina River drainages (Table 2), which represented approximately 54% of the total area effort in 2019. Upper Susitna drainage lakes were the next most fished waters, with 21% of the total area effort being expended there. Effort in Upper Susitna drainage lakes was higher than it has been over the past several years and received 56% more angler-days than the recent five-year average (Table 2). Area biologists have also observed an increase in winter ice fishing effort on Lake Louise and Susitna Lake in 2019 and registered 20 icehouses, which is the highest number ever registered for these lakes and above the 15-icehouse average for the previous five years. Because effort is not reported temporally, this observed increase in the winter fisheries on these lakes may have contributed to the overall increase in effort in Upper Susitna drainage lakes.

Sockeye salmon are the predominant species harvested in the UCUSMA representing 54% of all species harvested from 2014 to 2018 and 47% in 2019 (Table 3). The next most harvested species

from 2014 to 2018 were Arctic grayling (16%) and king salmon (6%), followed by stocked rainbow trout, lake trout, Dolly Varden, burbot, whitefish, wild rainbow trout, and coho salmon.

Arctic grayling are the predominant species caught in the UCUSMA representing 47% of all species caught from 2014 to 2018 and 52% in 2019 (Table 4). The next most caught species from 2014 to 2018 were sockeye salmon (19%), followed by lake trout, stocked rainbow trout, king salmon, wild rainbow trout, Dolly Varden, whitefish, burbot, and coho salmon.

Wild sockeye salmon stocks from the Copper River drainage are enhanced with fish produced by the Gulkana Hatchery. Production of sockeye salmon began in 1973 to mitigate lost spawning and rearing capacity with reconstruction of the Richardson Highway and has continued ever since. The Gulkana Hatchery is owned by ADF&G and operated under a lease agreement by Prince William Sound Aquaculture Corporation (PWSAC) and is located on the Upper Gulkana River near the community of Paxson. Egg takes are conducted near the hatchery and incubation and start-up rearing are accomplished at the hatchery. Fry are subsequently released at Crosswind, Paxson, and Summit Lakes and the returning adults are harvested by the sport, personal use, and subsistence fisheries in the Upper Copper River drainage and commercial and subsistence fishers in the Copper River District located in Prince William Sound.

Within the UCUSMA, the Division of Sport Fish manages numerous freshwater sport fisheries, one personal use fishery, and three subsistence fisheries. The personal use fishery and one subsistence fishery target salmon in the Upper Copper River District, which is defined by regulation as all waters of the mainstem Copper River from the mouth of the Slana River downstream to an east-west line crossing the Copper River approximately 200 yards upstream of Haley Creek (5 AAC 01.605; Figure 2). Another subsistence salmon fishery occurs on the Copper River and in Tanada Creek in the Batzulnetas Area. The Batzulnetas Area fishery is located upstream of the Slana River and Tanada Creek, near the former Native Village of Batzulnetas and is outside of the Upper Copper River District boundaries (Figure 2). The remaining subsistence fishery targets freshwater finfish (excluding salmon) and occurs in freshwaters throughout the management area. The freshwater finfish subsistence fishery primarily targets whitefish, although other species may be taken as specified. In addition to these state fisheries, federal subsistence salmon and freshwater finfish fisheries also occur in the UCUSMA.

Federal subsistence salmon fisheries run concurrently with state fisheries in the Upper Copper River District and Batzulnetas Area. The Alaska National Interest Lands Conservation Act (ANILCA) established a rural priority subsistence use of fish and game on lands and waters for which the federal government asserts jurisdiction. Under ANILCA, the federal government asserts management responsibility over waters within and adjacent to the Wrangell-St. Elias National Park and Preserve (including the Copper River mainstem from Haley Creek upstream) and the Gulkana River National Wild River corridor to ensure subsistence needs for federally qualified rural residents are met. The State of Alaska has also established a priority for subsistence use of fish and game by Alaskan residents (AS 16.05.258 (b)) and does not discriminate between rural and urban residents (consistent with Alaska State Constitution Article VIII, sections 3 and 15). The federally managed subsistence salmon fisheries in the Upper Copper River District require significant coordination between state and federal managers to ensure state escapement goals are attained.

RECENT BOARD OF FISHERIES ACTIONS

In December 2017, 12 proposals were considered to change subsistence, personal use or sport fishing regulations within the Upper Copper River and Upper Susitna River drainages. The BOF adopted four of those proposals, rejected seven, and took no action on one.

The BOF adopted one proposal to amend the Copper River Subsistence Salmon Fisheries Management Plan setting the season for the state subsistence fishery in the Batzulnetas Area of the Copper River in regulation rather than annually by emergency order.

The BOF repealed language in the Copper River Personal Use Dip Net Salmon Fishery Management Plan requiring the automatic reduction in maximum harvest level for the Chitina Subdistrict personal use dip net fishery from 100,000–150,000 salmon to 50,000 salmon when the Copper River District commercial drift gillnet fishery is closed for 13 or more consecutive days.

The board adopted two department proposals specific to area sport fisheries. The first simplified Gulkana River drainage regulations by replacing seasonal closures of the sockeye salmon fisheries in Paxson and Summit Lakes and Gunn Creek with complete closures. The second allowed for the use of bait and treble hooks in the flowing waters of the Upper Susitna River drainage with the exception of the Tyone River drainage.

In December 2014, the BOF voted to support four proposals and oppose 14 and took no action on two of the proposals. The BOF adopted one proposal providing the department emergency order authority to establish a bag limit for king salmon taken with a fish wheel and reduce the bag limit for king salmon taken with either a fish wheel or dip net in the Glennallen Subdistrict subsistence fishery during times of king salmon conservation.

A proposal was adopted that changed the annual limit in the Chitina Subdistrict personal use dip net salmon fishery, basing it on family size. The limit was set at 25 salmon for the head of household and 10 salmon for each dependent of the permit holder, except that only one king salmon may be retained per household. The BOF also repealed the supplemental harvest component of the Copper River Personal Use Dip Net Salmon Fishery Management Plan.

The BOF adopted two department proposals that were specific to the area sport fisheries. The first aligned the rainbow trout bag and size limits in Bridge Creek with those in Summit Lake (Tebay River drainage). The second updated the list of Upper Copper River and Upper Susitna River drainages area stocked waters in regulation.

FISHERY DESCRIPTIONS

KING SALMON SPORT FISHERIES

Background and Historic Perspective

The Copper River drainage supports the only anadromous returns of king salmon in the UCUSMA. No anadromous returns of king salmon occur in the Upper Susitna River drainage, upstream of the Oshetna River.

King salmon returning to the Copper River drainage pass through the Copper River Delta and enter the Copper River in early May. The peak run timing into the Copper River is from mid-May to mid-June, with the run essentially complete by July 1. However, small numbers of king salmon continue to enter the Copper River through August. King salmon make their way to spawning

areas in the Upper Copper River tributaries through June and July and spawn mid-July through August. There are no known king salmon spawning streams downstream of Haley Creek.

King salmon are found in at least 40 tributaries distributed throughout the Copper River Basin. Aerial escapement surveys have been conducted in 35 of these systems, with nine of these systems (Little Tonsina River, Greyling Creek, Mendeltna Creek, Kaina Creek, Indian River, Gulkana River, East Fork Chistochina River, and Manker and St. Anne Creeks) surveyed consistently from 1966 (Roberson and Whitmore 1991) through 2004. However, aerial index counts have proven to be an unreliable index of overall king salmon escapement in the Copper River drainage. There was a high variability in the proportion of total escapement between years and most of the index streams disproportionately represented early run stocks.

Radiotelemetry conducted by the department from 2002 to 2004 indicated 45% of the king salmon returns to the Klutina River and 16% to the Tonsina River spawned in the index streams. The remainder spawned in the glacial mainstem of those rivers (Savereide 2005a). The study also indicated that the nine index streams represented only 26–46% of total escapement in the Copper River drainage. Therefore, annual aerial index counts were reduced and currently occur on only four index streams: Gulkana River, East Fork Chistochina River, and Manker and St. Anne Creeks in the Klutina River drainage. These four streams provide comparable year to year indices of escapement in these systems and results are reported in an annual internal memo. Of these systems, only the indices for the Gulkana River have correlated with drainagewide escapement estimates for king salmon.

The *Copper River King Salmon Management Plan* was adopted by the BOF in 1996 and is the primary guide to management of king salmon stocks in the Copper River drainage. Copper River king salmon stocks are harvested in (1) commercial and subsistence gillnet fisheries in the Copper River District near the mouth of the river, (2) a personal use dip net fishery in the Chitina Subdistrict near Chitina, (3) a subsistence dip net and fish wheel fishery in the Glennallen Subdistrict between the Chitina/McCarthy Bridge and Slana River, and (4) sport fisheries in various tributaries. Because most of these fisheries are composed of mixed stocks, Copper River king salmon are managed in aggregate to achieve a drainagewide spawning escapement of 24,000 or more fish.

Although an extensive amount of genetic work has been conducted on Copper River king salmon stocks (Seeb et al. 2006), current technologies and a lack of sufficient data preclude managing fisheries for stock specific harvest (Templin et al. 2011). Assessment of the genetic structure of Copper River king salmon stocks included sampling from all Copper River tributary drainages (Seeb et al. 2006). These drainages appear to have four general genetic groups that distinguish the Upper Copper River, the Gulkana River, the Tonsina, Klutina, Tazlina River drainages, and the Chitina River drainage. Future genetic sampling and analysis may provide greater resolution.

From 1960 to 1998, harvest of king salmon gradually increased in the commercial, personal use, subsistence, and sport fisheries of the Copper River drainage (Somerville 2017). For example, total king salmon harvest in the Copper River averaged 12,709 salmon with a range of 8,174 to 15,919 salmon from 1960 to 1964, and from 1994 to 1998, averaged 73,934 salmon with a range of 60,139 to 87,343 salmon. The increase in harvest may be attributable to a general increase in stock abundance, increased participation and efficiency of the commercial fishery, and increased participation in the upriver personal use, subsistence, and sport fisheries. Since 1998, king salmon harvests in all Copper River fisheries have generally declined (Somerville 2017). Declining

harvests appear to be the result of declining production rather than decreased participation or efficiencies in the various fisheries. However, since 2009, implementation of inseason management restrictions in all fisheries (Table 5), except subsistence, have directly reduced harvests in these fisheries.

King salmon sport fisheries occur in various tributaries of the Copper River. Fisheries on the Gulkana and Klutina Rivers currently account for about 90% of the sport harvested king salmon in the UCUSMA (Table 6). Sport harvest of king salmon in the Upper Copper River demonstrated the same trend as overall harvest with a steady increase from 1977 (the first year sport harvest of fish was estimated and reported) through 1996 when sport harvest peaked at 9,116 king salmon (Somerville 2017). King salmon sport harvest declined after 1996 to lows of 285 king salmon in 2013 and 327 king salmon in 2016. Changes in sport harvest levels of king salmon appear to trend with overall abundance (Table 7), inseason regulatory restrictions (Table 5), and resulting declines in angling effort (Table 2).

In 1994, an annual bag limit of five king salmon was established for the Upper Copper River drainage in an attempt to stem rising king salmon harvests. Sport harvest of king salmon continued to increase through 1996 despite imposition of the annual limit. With adoption of the *Copper River King Salmon Management Plan*, guides were prohibited to fish while actively guiding and could not operate on Tuesdays during the king salmon season, but this appeared to have little or no effect on guided harvests. In 2000, the annual limit for king salmon in the Upper Copper River drainage was reduced from five to four and the guide restriction was repealed but guides still could not retain a king salmon while guiding. From 2009 to 2019 inseason management actions including reduction of the annual limit, bait restrictions, and fishery closures were implemented in response to low king salmon run numbers (Table 5). King salmon sport harvests ranged from 285 to 2,416 fish during this period and averaged 1,229 fish. In 2015, 2018, and 2019, no inseason management actions were implemented and 1,343, 1,280, and 1,565 king salmon were harvested each year, respectively, in the Upper Copper River sport fisheries (Table 3).

To more accurately assess king salmon abundance in the Copper River, research was initiated in 1995 to estimate the timing and contribution of king salmon stocks from its major tributaries. In 1996, a weir was operated on the Gulkana River to enumerate king salmon in tandem with a creel survey to estimate king salmon harvest (LaFlamme 1997). From 1997 to 1999, a coded wire tagging study was conducted in the Gulkana, Klutina, Tonsina, and East Fork Chistochina Rivers. Unfortunately, the methods used for marking wild king salmon fry with coded wire tags proved ineffective to assess returns due to a low tag recovery rate (Sarafin 2000; Brase and Sarafin 2004). Despite the failures in this study, a new effort to assess Copper River king salmon productivity was initiated in 2014 where king salmon smolt and fry have been coded-wire-tagged (Philip Joy, ADF&G Sport Fish Biologist, Fairbanks, personal communication). Adult return monitoring began in 2017 and will continue through 2023. Early results indicate good tag returns.

From 1999 to 2004, radiotelemetry studies were used to determine king salmon distribution and timing of entry into the spawning streams of the Copper River (Evenson and Wuttig 2000; Wuttig and Evenson 2001; Savereide and Evenson 2002; Savereide 2003, 2004, 2005a–c). Estimates of total escapement were obtained during these studies from a mark–recapture experiment in which king salmon were captured and tagged during the radio transmitter deployment and then recaptured in the Chitina Subdistrict personal use fishery. In 2002, a separate mark–recapture study was initiated using only fish wheels as the means to capture (for marking) and recapture marked and unmarked king salmon. This continuing study, conducted by the Native Village of Eyak and LGL,

Inc., has provided a postseason estimate of annual king salmon escapement to the Copper River since 2003 (Smith et al. 2003; Smith 2004; Smith and van den Broek 2005a–b; van den Broek et al. 2007, 2008, 2009b, 2010b, 2011, 2012; Pelekis et al. 2013; Whissel et al. 2014, 2015; Piche et al. 2016–2019).

The number of guides operating on area rivers increased from the early 1980s through 1990s. For example, prior to the 1986 season, only one individual specialized in guiding anglers for king salmon on the Gulkana River. By 1989, five guides were operating on the Gulkana River (Potterville and Webster 1990), and from 2007 through 2015, 8–29 guides operated annually on the Gulkana River (Sigurdsson and Powers 2009–2014, 2016). On the Klutina River, 15–28 guides have operated there annually from 2005, when logbooks became required, through 2015. Inseason management actions from 2009 to 2014 affected the number of guides operating in the Upper Copper River and the choice of rivers on which they operated. Freshwater guide logbooks were discontinued after 2018.

Recent Fishery Performance

The 2019 king salmon return (Table 7) allowed for the Upper Copper River drainage sport fisheries to remain open without restriction. King salmon total sport harvest was estimated at 1,565 fish and catch at 4,454 fish (Table 8). The Gulkana River accounted for 54% of the total king salmon harvest and 74% of the total king salmon catch in 2019 (Table 6).

The 2020 king salmon return to the Copper River was substantially weaker than forecast and required restrictions to UCUSMA sport fisheries. On June 20, 2020, the annual limit of king salmon for the Upper Copper River drainage was reduced from four to one fish. By this point in season, the cumulative commercial harvest of king salmon and the king salmon counts at the Gulkana River counting tower were both well below average and preliminary data from the Native Village of Eyak (NVE) research fish wheels indicated that the escapement goal would not be achieved. In order to ensure sufficient spawning escapement while still providing sport fishing opportunity, the reduction in the sport fishery annual limit was implemented. Even with the restrictions, escapement fell below the goal of 24,000 or more king salmon.

Gulkana River King Salmon Sport Fishery

Background and Historic Perspective

The Gulkana River drainage has historically supported the largest sport fishery for harvest (Table 6) and catch (Table 8) of king salmon in the UCUSMA. The drainage originates in the Alaska Range and flows south to join the Copper River near the community of Gulkana. The section of the Gulkana River upstream from Sourdough has been designated as “wild” under the Wild and Scenic Rivers Act of 1968. Access to the river, downstream of Paxson Lake, is limited to seven state and federal trail and site easements, and one privately owned and controlled site accessible from the Richardson Highway, which parallels much of the river. Anglers use rafts, canoes, and powerboats to gain access to the more remote sections of the river. Raft and canoe anglers frequent the various sections of the river from Paxson Lake downstream to the Richardson Highway Bridge. Powerboat operators generally launch at the Bureau of Land Management (BLM) Sourdough launch and use the river from approximately two miles below Sourdough upstream to several miles above the confluence of the West Fork. Powerboat operators also launch at the Richardson Highway Bridge and fish a five-mile reach of the river above the bridge. Powerboat operators access the mouth of the Gulkana River when the river level is sufficiently

high, by launching at the Richardson Highway Bridge and boating down the Gulkana River, and when water levels are lower by launching in the Gakona River, to the north, and then boating down the Copper River.

Regulations used to manage the Gulkana River king salmon fisheries accommodate concurrent fisheries on other species, provide protection to these other species populations, and provide protection for spawning king salmon while still providing maximum opportunity for the anglers who target king salmon. Twelvemile Creek, the Middle Fork drainage, and all waters of the Gulkana River drainage upstream of the Middle Fork confluence are closed to fishing for king salmon year-round to protect spawning fish (Figure 3). The remainder of the river is open to king salmon fishing from January 1 through July 19. From June 1 through July 19, anglers may use bait, artificial lures, and treble hooks upstream from the Richardson Highway Bridge to an ADF&G marker located 7.5 miles upstream of the West Fork confluence. From June 1 through July 31, anglers are limited to using only single-hook, artificial flies from the Richardson Highway Bridge downstream to an ADF&G marker approximately 500 yards downstream of the confluence with the Copper River. In all waters of the Gulkana River drainage, upstream of a marker 7.5 miles upstream of the West Fork confluence with the mainstem, and in the entire Gulkana River drainage from July 20 to May 31, only unbaited, single-hook, artificial lures may be used. This restriction is intended to protect the resident rainbow trout population and the small population of steelhead that return to the Gulkana River.

The goal of past and current management of king salmon on the Gulkana River has been to ensure sustained yield, but there is currently no escapement goal specific to the Gulkana River. The *Copper River King Salmon Fishery Management Plan* was developed in 1996 to provide for king salmon escapement at or above average historic levels. To meet this goal, escapement objectives (postseason indices of escapement only) were developed for several river systems based on the 1977–1995 average aerial index count for those systems. An aerial escapement index objective of 1,200 king salmon has been used for the Gulkana River. An inseason escapement count target of 4,070 king salmon past the Gulkana River counting tower was developed using an expansion of the aerial survey indices from 2002 through 2011 to the tower counts for those years (Maclean 2013). This target is not a formal escapement goal, but rather a target to help guide inseason management decisions, that depend on voluntary reports from sport anglers and guides, Copper River subsistence and personal use fishers, NVE fish wheel capture and recapture counts, and tower counts.

A weir was operated on the Gulkana River in 1996 to provide a count of king salmon escapement concurrent with a creel survey conducted that same year (LaFlamme 1997). The estimated total inriver run in 1996 was 13,840 and estimated spawning escapement was 11,684.

In 2002, ADF&G initiated a multi-year project with BLM to estimate the escapement of king salmon in the Gulkana River (Taras and Sarafin 2005; Perry-Plake et al. 2007; Perry-Plake and Antonovich 2009; Perry-Plake and Huang 2011; Savereide 2010, 2011; Maclean 2013; Schwanke 2016). A counting tower site was established approximately 2 miles upstream of the West Fork confluence to enumerate king salmon migrating upstream. The estimated escapement passing the counting tower generally decreased from 6,390 king salmon in 2002 to a low of 1,044 king salmon in 2016. Counts increased in 2017 and 2018 and peaked at 8,352 king salmon in 2019. In 2020, the tower count was 2,418 king salmon (unpublished data on file with the Gulkana River Chinook Salmon Counting Tower Project; contact Tracy Hansen, ADF&G Division of Sport Fish, Glennallen). Radiotelemetry data from a drainage wide king salmon study

(2002–2004), indicated ~50–86% of the Gulkana River bound king salmon migrated past the counting tower (Taras and Sarafin 2005; Perry-Plake et al. 2007). In contrast, a 2013–2015 telemetry study specific to the Gulkana River drainage indicated that approximately 50% of the king salmon spawned above the counting tower during those years. The cause of this apparent shift in spawning distribution is not clearly identified and could be the result of low water conditions in 2013–2015 or project methodology.

King salmon begin entering the Gulkana River in early to mid-June. The sport fishery peaks during late June–early July but fishing for king salmon continues until the season closes July 20. Spawning begins in mid-July and continues through late August. Most spawning occurs upstream of the confluence of the West Fork (Figure 3). King salmon harvest and catch increased in the Gulkana River through the mid-late 1990s peaking in 1992 at 5,892 fish and averaging 5,135 fish from 1996–1998 (Somerville 2017). King salmon harvest declined after 1998. Harvest from 2009–2019 averaged 572 king salmon (Table 6), but inseason action was taken in all these years except 2015, 2018, and 2019 to specifically reduce harvest of king salmon in the Gulkana River (Table 5).

Most effort and harvest of king salmon from the Gulkana River occurs from the Richardson Highway Bridge upstream to the confluence of the West Fork (Potterville and Webster 1990; LaFlamme 1997). Comparatively, few anglers appear to fish the single-hook, artificial fly only area downstream of the Richardson Highway Bridge. Although many anglers floated the mainstem above the West Fork, the harvest of king salmon appeared minimal in this reach because most king salmon did not arrive to the area until after the July 19 spawning season closure. Guided anglers have higher harvest and catch rates as do anglers using bait. Most anglers access the river by raft, but shore anglers are as successful while having limited river access within a few miles up or downstream of the Richardson Highway Bridge, Alyeska Pipeline access bridge, and three walk-in locations along the river.

Recent Fishery Performance

Prior to 2009, there were no restrictions imposed on Gulkana River king salmon sport fishery and annual harvests ranged from 1,890 to 4,177 king salmon over the previous 10-year period (Somerville 2017). Over the last five years (2014–2018), the sport harvest of king salmon in the Gulkana River averaged 544 fish and 545 fish from 2009 to 2018 (Table 6). Since 2009, areawide sport fish management restrictions were taken in all years except 2015, 2018, and 2019 to ensure adequate spawning escapement of king salmon to the Copper River drainage (Table 5). These management actions reduced the annual limit of king salmon each year from four fish to either two or one fish and additionally restricted the Gulkana River king salmon fishery to catch-and-release and no bait in 2011–2013, and a full closure in 2009 and 2016. Even during years with no restrictions harvest levels were less than one third the average harvest prior to 2009.

Gulkana River king salmon harvest of 848 fish (Table 6) and catch of 3,297 fish (Table 8) were above the five-year average in 2019, probably as a result of the hot and dry weather throughout the summer that made for excellent fishing conditions. Additionally, the Gulkana River salmon counting tower recorded its largest king salmon return since the project began in 2002 (unpublished data on file with the Gulkana River Chinook Salmon Counting Tower Project; contact Tracy Hansen, ADF&G Division of Sport Fish, Glennallen) and overall, inriver abundance of king salmon was above average for the Copper River (Table 7).

Current Issues and Fishery Outlook

Most of the land adjacent to the Gulkana River below the Sourdough landing is owned by Ahtna Native Corporation or is in other private hands. Access to the river is very limited for shore-based anglers and most access is done via float raft or jet boat. At times, anglers employing these access methods clash for fishing holes and differences in the kind of fishing experience each may be seeking.

Weather and climate patterns have warmed over the last few decades and the area has experienced decreased snowfall and more variable levels of rain. The Gulkana River flow is highly reactive to changes in precipitation and has experienced both record flood and drought levels over the last 10 years. As the climate and weather patterns continue to change, these changes may affect overall productivity of the river and may need to be considered in future management of the Gulkana River king salmon sport fishery.

Recent Board of Fisheries Actions

There are no proposals before the BOF during the 2021 cycle directly affecting the king salmon sport fisheries of the Gulkana River. However, ADF&G has proposed a new spawning escapement goal for king salmon in the Copper River drainage and **Proposal 5** requests an Optimal Escapement Goal (OEG) be established instead. These new goals may affect management of the Gulkana River king salmon sport fisheries in some years. **Proposal 41** seeks to remove the mandatory inside area closures in the Copper River District commercial gillnet fishery potentially affecting the abundance of early returning king salmon stocks returning to Upper Copper River and the Gulkana River.

A proposal to prohibit catch-and-release sport fishing in the Upper Copper/Upper Susitna Management Area was submitted for the December 2017 BOF meeting in Valdez. The proposal failed.

There were 3 proposals submitted for the December 2014 BOF meeting in Cordova that could have affected the Gulkana River king salmon sport fishery. All three sought restrictions for barbless hooks in one form or another. All three proposals failed.

Klutina River King Salmon Sport Fishery

Background and Historical Perspective

The Klutina River supports the second largest sport fishery for king salmon in the UCUSMA. The semi glacial Klutina River drops rapidly out of Klutina Lake and enters the Copper River at the community of Copper Center. Access to the river is available from the old and new Richardson Highways and along the Klutina Lake Road (also called the Brenwick-Craig Road), which parallels the river. Shore anglers participate in the fishery adjacent to the Richardson Highway and the Klutina Lake Road. Jet-powered riverboats are used by experienced operators to access the upstream portions of the river. The river has considerable stretches of whitewater and is very challenging to navigate. Jet boats are launched from private land adjacent to the highway or from a boat launch within the highway right of way (ROW) along the new Richardson Highway Bridge. Rafters are the primary boat users of the Klutina River and launch from sites located at mile four, mile 14, and mile 22 of the Klutina Lake Road, and exit the river at the new Richardson Highway Bridge. The fast water of the Klutina River limits the number of resting pools for king salmon to less than two dozen good fishing sites accessible to most anglers in the lower portion of the river.

Variable seasons and areas closed to sport fishing for king salmon on the Klutina River provide protection to king salmon spawners. The entire river opens to sport fishing for king salmon on July 1 each year. River sections are closed to sport fishing for king salmon beginning with the upper reaches to protect known spawning areas. From an ADF&G marker located adjacent to mile 19.2 of the Klutina Lake Road upstream to Klutina Lake, king salmon may be taken through July 19. From mile 19.2 downstream to an ADF&G marker at mile 13.0 of the Klutina Lake Road, king salmon may be taken through July 31. From mile 13.0 downstream to the confluence of the Copper River, king salmon may be taken through August 10 (king salmon may not be taken in Klutina Lake or the tributaries entering the lake or the river). The tributary closure of Manker Creek extends for a ¼-mile radius around the confluence with Klutina River.

Without a reliable measure of escapement for the Klutina River, no specific fishery objectives have been established. The king salmon fishery is generally managed based on the Copper River drainage escapement goal. However, restrictive management of the Klutina River sport fishery may be implemented to specifically ensure adequate escapement of Klutina River king salmon based on aerial index counts of the clearwater tributaries if overall king salmon returns appear weak. Anecdotal reports from sport anglers, guides, and observations by ADF&G staff and trends in the Copper River subsistence and personal use fisheries, and catch data from the Copper River commercial gillnet fishery and NVE/LGL project fish wheels may all be used to support management decisions specific to the Klutina River.

The Klutina River king salmon return is managed as a single stock. Anglers and guides consider the return to be two separate stocks of king salmon, composed of an early and late run. Although early returning fish primarily spawn in Manker and St. Anne Creeks and the later returning king salmon primarily spawn in the mainstem Klutina River, early and late returning king salmon do spawn in both locations, and there is sufficient overlap in entry timing of both tributary and mainstem spawners that no distinct temporal differences between early and late returning king salmon have been identified. Genetic sampling conducted from 2003–2005 had insufficient resolution to determine a significant genetic difference between the tributary and mainstem spawners (Seeb et al. 2009).

King salmon begin entering the Klutina River in late June, with the run continuing into August. The king salmon sport fishery opens on July 1, peaks during the third week of July, and continues until the season closes on August 11. King salmon spawn from late July through August in tributary streams of the river and lake and in the mainstem of the river. Most spawning is believed to occur upstream of a point adjacent to mile 19.2 on the Klutina Lake Road.

King salmon harvest and catch increased in the Klutina River through the mid-to-late 1990s and declined after 1999 (Somerville 2017). Harvest peaked in 1999 at 3,489 fish and averaged 3,146 king salmon from 1996–1999 (the four highest harvest years). Harvest from 2009 through 2019 averaged 555 king salmon, but inseason action was taken in all these years, except 2015, 2018, and 2019, to specifically reduce harvest of king salmon in the Klutina River (Tables 5 and 6).

Several creel surveys conducted on the Klutina River indicated that 80–88% of king salmon were harvested by anglers accessing the river by boat (Roth and Delaney 1989; Potterville and Webster 1990; Schwanke 2009). For harvest by boat, 70% of anglers used power boats and 17% used rafts (Schwanke 2009). Furthermore, anglers accessing the fishery via boats operated by commercial guide services were more successful. Nearly 80% of the harvest of king salmon and 90% of the king salmon catch can be attributed to guided boat anglers. Although no further creel

surveys have been conducted since 2006, observation of the fishery indicates that 70–90% of anglers accessing the river by boat currently do so with nonmotorized rafts rather than jet boats. This change was primarily driven by guides shifting to the safer and more cost-effective rafts.

Recent Fishery Performance

Prior to 2009, there were no restrictions imposed on Klutina River king salmon sport fishery and annual harvests ranged from 1,160 to 3,489 king salmon over the previous 10-year period (Somerville 2017). Since 2009, areawide sport fish management restrictions were taken in all years except 2015, 2018, and 2019 to ensure adequate spawning escapement of king salmon to the Copper River drainage (Table 5). These management actions reduced the annual limit of king salmon each year from four fish to either two or one fish and additionally restricted the Klutina River king salmon fishery to catch-and-release and no bait in 2009 and 2012, and a full closure in 2016. Even during years with no restrictions, harvest levels were less than half the average harvest prior to 2009. Over the last five years (2014–2018), the sport harvest of king salmon in the Klutina River averaged 469 fish and 552 fish from 2009 to 2018 (Table 6).

Klutina River king salmon harvest of 589 fish (Table 6) in 2019 was about average compared with the last 5–10 years and the catch of 940 fish (Table 8) was below average. The Klutina River king salmon sport harvest and catch for 2019 are low considering no inseason restrictions were imposed and overall Copper River inriver passage was above average. The data suggest the abundance of the Klutina River component of the 2019 Copper River king salmon run was below average.

Current Issues and Fishery Outlook

Most of the land adjacent to the Klutina River upstream of the Richardson Highway is owned by Ahtna Native Corporation. In 2019 Ahtna Native Corp. settled a lawsuit with the state that established a 100-foot-wide State of Alaska ROW for Klutina Lake Road. However, the settlement fell short of clearly establishing the allowable uses within the ROW and allowable access to the river without paying Ahtna for that access. Klutina Lake Road has been the traditional access to boat and raft launch sites at 14-mile and 22-mile of the road and shore fishing where the ROW intersects the river. River access along Klutina Lake Road remains in dispute.

Recent Board of Fisheries Actions

There are no proposals before the BOF during the 2021 cycle directly affecting the king salmon sport fisheries of the Klutina River. However, the ADF&G has proposed a new spawning escapement goal for king salmon in the Copper River drainage and **Proposal 5** requests an Optimal Escapement Goal (OEG) be established instead. These new goals may affect management of the Gulkana River king salmon sport fisheries in some years. **Proposal 41** seeks to remove the mandatory inside area closures in the Copper River District commercial gillnet fishery potentially affecting the abundance of early returning king salmon stocks returning to the Upper Copper River.

A proposal to prohibit catch-and-release sport fishing in the Upper Copper Upper Susitna Management Area was submitted for the December 2017 BOF meeting in Valdez. The proposal failed.

There were three proposals submitted for the December 2014 BOF meeting in Cordova that could have affected the Klutina River king salmon sport fishery. All three sought some form of restrictions for barbless hooks. All three proposals failed.

Other Copper River Basin King Salmon Sport Fisheries

Background and Historical Perspective

Less than 10% of the harvest of king salmon in the UCUSMA occurs in systems other than the Gulkana and Klutina Rivers. The majority of this remaining harvest occurs in the Tonsina River. The semiglacial Tonsina River flows from Tonsina Lake into the Copper River downstream of the Klutina River confluence (Figure 1). The Tonsina River is crossed by the Richardson Highway, Edgerton Highway, and Alyeska Pipeline bridges. Shore anglers participate in the fishery adjacent to the Edgerton and Richardson Highways; some angling is conducted by raft between the Richardson and Edgerton Highways, and some angling is conducted by fly-in anglers fishing the Tonsina Lake outlet. Some boat anglers access the Tonsina River to fish the mouth by boating upstream from the Chitina-McCarthy Bridge.

King salmon return to the Tonsina River drainage from late June through early August, similar to king salmon in the Klutina River. Spawning occurs in tributaries and mainstem of the Tonsina River from mid-July through August. From 2002 to 2004, the Tonsina River king salmon run represented approximately 12% of the total Copper River return, a similar percentage as the run in the Klutina River (Evenson and Wuttig 2000; Wuttig and Evenson 2001; Savereide and Evenson 2002; Savereide 2003, 2004, 2005 a–c).

The sport harvest of king salmon in the Tonsina River has averaged 53 fish over the last five years (2014–2018) and 37 fish over the last 10 years (2009–2018; Table 6). Harvest figures for the Tonsina River vary greatly due to a low number of angler responses to the SWHS. Over the last five years, the SWHS has estimated 496 angler-days in the Tonsina River drainage compared to 6,605 angler-days for the Gulkana River mainstem and 10,876 angler-days for the Klutina River drainage (Table 2).

Current regulations allow sport fishing for king salmon in the Tonsina River from July 1 through July 19 above the downstream edge of the Alyeska Pipeline access bridge, and from July 1 through August 10 downstream of the access bridge. The July 20 closure date for the upper river provides protection for spawning king salmon. Tonsina Lake and all tributaries to the Tonsina River are closed to king salmon fishing. The current bag and possession limit for king salmon ≥ 20 inches in this drainage is one fish, with an annual bag limit of four king salmon ≥ 20 inches for the Copper River drainage.

Current Issues and Fishery Outlook

Because most king salmon sport fishing is done on the Gulkana and Klutina Rivers, few if any issues arise on the other king salmon fisheries that have experienced sport angler effort over the years (Tonsina River, mouth of Kiana Creek, mouth of the East Fork Chistochina). Of these only the Tonsina River gets consistent annual angler effort. There has been no reported harvest of king salmon from Tazlina or Chistochina River drainages for over 20 years. Like all other parts of the UCUSMA, access is the most challenging aspect of king salmon fisheries on these systems.

SOCKEYE SALMON SPORT FISHERIES

Background and Historic Perspective

In the UCUSMA, only the Copper River drainage supports wild and enhanced stocks of sockeye salmon. Wild stocks are widely distributed and are present in approximately 125 of the Upper Copper River tributaries, whereas enhanced stocks are limited to the Gulkana River from

production at the Gulkana Hatchery near Paxson. The abundance of salmon migrating into the Copper River has been estimated annually since 1978 by sonar at Miles Lake. Although there is no species apportionment program in place, it is assumed that most of the fish passing the sonar are sockeye salmon. Sonar counts are discontinued July 31 each year, prior to the end of the sockeye run and before significant numbers of coho salmon enter the river. With the exception of 1993–1995, the escapement of sockeye salmon to Upper Copper River tributaries has been documented from 1966–2019 by the Division of Commercial Fisheries through aerial index counts to monitor spawner distribution in the drainage (Pirtle 1980; Randall et al. 1981; Brady et al. 1991; Hollowell et al. 2007; Botz et al. 2010–2013; Sheridan et al. 2013, 2014; Wiese et al. 2015; Haught et al. 2017; Russell et al. 2017; Vega et al. 2019).

In addition to harvest in the tributary-based sport fisheries, sockeye salmon stocks of the Upper Copper River drainage are harvested in the Copper River District commercial drift gillnet fishery, the Chitina Subdistrict personal use fishery, and the Glennallen Subdistrict subsistence fishery (Table 9). The management of these fisheries is based on the abundance of all Copper River drainage stocks as counted past the Miles Lake sonar station. Under the *Copper River District Salmon Management Plan* (5 AAC 24.360), the department is directed to manage the commercial fishery to achieve an inriver allocation of 15,000 salmon (all species) for sport fishery harvest, 61,000–82,500 sockeye salmon (wild stocks only) for subsistence harvest, 100,000–150,000 (including hatchery stocks) for personal use harvest, 360,000–750,000 sockeye salmon for spawning escapement, 17,500 for spawning escapement of other salmon, and an amount determined annually for hatchery brood and surplus stocks.

Since 1999, the Klutina River (Figure 1) has consistently supported the largest sockeye salmon sport fishery in the UCUSMA (Table 6). Sockeye salmon begin entering the Klutina River in mid-June and continue through August. The Klutina River accounted for 33–54% of the sockeye salmon radiotagged in the Copper River from 2005 to 2009 (Wade et al. 2007–2010). Spawning activity is known to occur in various locations of the river, lake, and tributaries.

Prior to 1999, the Gulkana River generally supported the largest sockeye salmon sport fishery in the UCUSMA. The sockeye salmon run to the Gulkana River is composed of both wild and hatchery stocks and has accounted for 7–19% of the sockeye salmon radiotagged in the Copper River from 2005–2009 (Wade et al. 2007–2010). The Gulkana Hatchery has been producing sockeye salmon since the early 1970s, and in the late 1990s produced enhanced returns of up to 800,000 adult salmon (Sharp et al. 2000). A strontium chloride otolith marking program was begun for hatchery fish in 2000. Issues with the strontium marking process caused mortality in marked sockeye salmon fry during brood years 2000 and 2001 significantly reducing adult returns (primarily 2004–2006) from those brood years. Since 2000, hatchery returns have ranged from about 54,010 to 581,000 sockeye salmon (S. Haught, Commercial Fisheries Biologist, ADF&G, Cordova, personal communication).

Gulkana River sockeye salmon life history and stock status data is limited beyond basic run timing. Spawning takes place in several upper reach tributaries and lakes. The Gulkana River sockeye salmon return begins in early June and continues into September. The hatchery enhanced return has a run timing that overlaps the late wild stock component. Except for the period from 1993 to 1999, escapement of sockeye salmon to the Gulkana River has been documented by aerial index counts since 1966 (Pirtle 1980; Randall et al. 1981; Brady et al. 1991; Hollowell et al. 2007; Botz et al. 2010–2013; Sheridan et al. 2013, 2014; Wiese et al. 2015; Haught et al. 2017; Russell et al. 2017; Vega et al. 2019).

Sockeye salmon passage has been recorded at a king salmon counting tower project initiated in 2002 on the mainstem Gulkana River upstream of the West Fork. These counts are considered minimums because sockeye salmon are still passing the tower site after the tower project ends. From 2002 to 2020 an estimated 8,292 to 48,024 sockeye salmon (including hatchery fish) passed the tower from May 27 to August 14 each year (unpublished data on file with the Gulkana River Chinook Salmon Counting Tower Project; contact Tracy Hansen, ADF&G Division of Sport Fish, Glennallen).

Recent Fishery Performance

From 2014 to 2018, sport harvest of sockeye salmon from UCUSMA waters averaged 9,512 fish, and 13,343 fish from 2009 to 2018 (Table 10). The sockeye salmon sport harvest in 2018 (2,943 fish) was the lowest since 1983 (Somerville 2017) and was dominated by the Klutina River where 1,597 sockeye salmon were harvested. The primary sport fisheries for sockeye salmon occur in the Klutina and Gulkana Rivers, accounting for an average of 96% of the UCUSMA sockeye salmon harvest from 2014 to 2018.

Sockeye salmon harvest from the Klutina River increased dramatically between 2006 and 2014 (Table 10). Harvest essentially doubled over the previous record high in 2006 and peaked at over 23,000 sockeye salmon in 2013. Sockeye salmon harvest declined after 2014 to more historic levels and averaged 8,324 sockeye salmon from 2014 to 2018. Angler effort on the Klutina River from 2007 through 2014 were some of the highest years on record as determined by the SWHS, with a high of 18,030 angler-days in 2012; the strong sockeye salmon runs likely contributed substantially to that effort (Table 2).

Sport harvest of sockeye salmon from the Gulkana River peaked in 1996 with a harvest of 7,418 sockeye salmon (Somerville 2017). Sockeye salmon sport harvest declined after 2000 reaching a low of only 533 sockeye salmon harvested from the Gulkana River in 2015. Sockeye salmon harvest rebounded some in 2016 to 853 fish. Sockeye salmon returns in the Gulkana River are currently underutilized by sport anglers primarily due to the late timing of enhanced sockeye salmon and low king salmon returns that have led to overall reduced fishing effort on the river.

The 2019 sockeye salmon run to the Upper Copper River was above average (Table 10) and due to the strong inriver abundance of fish, it was anticipated that the upper bound of the sustainable escapement goal was going to be exceeded, prompting the liberalization of the sport fishery (Appendix A1). On July 20, 2019, the sockeye salmon sport bag and possession limit increased from three to six fish for the remainder of the season. The total sockeye salmon sport harvest was estimated at 7,346 fish (Table 3) and catch at 8,630 fish (Table 4). Even with above average abundance and a liberalized fishery, the 2019 sport harvest was below both the five-year (9,512 fish) and 10-year (13,343 fish) average (Table 3). Aerial surveys conducted by the Division of Commercial Fisheries indicated that the majority of sockeye salmon returning to the Copper River in 2019 migrated to tributaries that are not generally fished by sport anglers, such as those in the Upper Copper and Upper Chitina River systems (Jeremy Botz, Commercial Fisheries Biologist, ADF&G, Cordova, personal communication). Aerial counts for the Klutina, Gulkana, and Tonsina Rivers—the 3 most fished systems for salmon in the UCUSMA—were below average. Sport harvest of sockeye salmon in the UCUSMA is driven by the Klutina River, which has included an average of 88% of the total areawide sockeye salmon harvest over the past 10 years. Although the Klutina River was still the largest contributor to sockeye salmon harvest in 2019 (Table 10), harvest was 27% below the five-year average and 48% below the 10-year average for

that system. Low abundance in the Klutina River is the primary reason why sockeye salmon sport harvest was below average in 2019.

The 2020 sockeye salmon return to the Copper River was substantially weaker than forecasted and required restrictions to UCUSMA sport fisheries (Appendix A1). On August 3, 2020, all waters of the Upper Copper River drainage were closed to sport fishing for sockeye salmon. By this point in the season, the inriver salmon objective monitored by Miles Lake Sonar was approximately 94,000 salmon below target. Additionally, 95% of the run had past the sonar by July 28 and daily sonar passage in July was trending 72% below the daily objective. Due to overall low sockeye salmon passage and concerns of the sockeye salmon escapement goal not being met, it was justified to close the sockeye salmon sport fishery.

The lower bound of the Copper River drainage sockeye salmon escapement goal has been met or exceeded in all of the past 20 years (2000–2019), and the estimated total return over the past 10 years has averaged approximately 2.3 million fish (Table 9). Inriver run strength was well above average in 2012–2015, and again in 2019, and exceeded the upper bound of the Copper River sockeye salmon escapement goal in those years. In 2013, 2014, 2015, and 2019, the sockeye salmon sport fish bag limit was increased from three to six fish. In contrast, the 2018 sockeye salmon run was well below average and Upper Copper River sport fisheries were closed for the first time ever. The 2020 run was also weak and required closure of the sport fishery. Although preliminary, it is anticipated that the total return in 2020 may be even lower than that of 2018 and spawning escapement may fall below the 360,000 lower bound escapement goal. Currently, the 2018 sockeye salmon return is the lowest on record since 1981.

Current Issues and Fishery Outlook

Issues and conflicts involving the Gulkana and Klutina Rivers sockeye salmon fisheries are similar to those previously noted for the king salmon fishery. Access and conflicts between users are the most common issues.

Sockeye salmon returns to Copper River were on a general increasing trend since the 1960s (Somerville 2017). The peak of this rise was in 2014 with a total return of 3,411,377 sockeye salmon. The 2015 sockeye return was 3,205,039 fish followed by a total return of 2,074,971 fish in 2016 (Table 9). Unpredictably weak returns in 2018 and 2020, with a well above forecast run in 2019, demonstrate what may be continued high variability in future Copper River sockeye salmon runs. Changing ocean conditions, warmer climate trends, and changes in freshwater rearing habitats appear to be affecting overall productivity of the Copper River sockeye salmon populations with ocean rearing conditions the most variable. These conditions may be affecting age and size at return, overall marine survival, and spawning resiliency of sockeye salmon, which will increase interannual variability in run strength and directly affect inseason management of this species (Connors et al. 2020). Managers will require more adaptive management strategies to ensure sustainability of the Copper River sockeye salmon populations and still meet the needs, as best as possible, of the various users of these populations.

Recent Board of Fisheries Actions

There is a single proposal before the BOF in 2021 specific to the Upper Copper River sockeye salmon sport fisheries. **Proposal 31** seeks to double the possession limit of sockeye salmon from three to six fish. The bag limit would remain three sockeye salmon.

There were no proposals submitted during the 2011 and 2014 BOF cycles that affected sockeye salmon sport fisheries in the UCUSMA.

COHO SALMON SPORT FISHERIES

Background and Historic Perspective

The UCUSMA coho salmon sport fishery is small compared to most coho fisheries in the state, with harvests rarely exceeding 100 fish since 2005 (Table 3). Coho salmon begin entering the Copper River in early August and make their way into the upper river mid-August through September. The number of coho salmon migrating into the Copper River are not assessed. Little is known about coho salmon populations in the Upper Copper River, but it is believed upriver populations are stable and the lack of harvest only reflects the lack of sport angler effort due to late run timing. Most coho salmon caught in the UCUSMA are taken from the Copper River in personal use and subsistence fisheries and compose less than 1% of the harvest in those fisheries. The primary sport fishery harvest of coho salmon occurs in the Tonsina River drainage. Coho salmon have not been documented in any waters of the Copper River upstream of Tazlina River.

WILD ARCTIC GRAYLING SPORT FISHERIES

Background and Historical Perspective

Wild Arctic grayling were the most harvested fish in the UCUSMA from 1977 to 1995 (Somerville 2017). Harvests declined after 1988 and have been surpassed nearly every year since 1996 by sockeye salmon, and by king salmon in 2005 and 2007 (Table 3). The decline in harvest from 1988 to 1999 most likely resulted from more restrictive regulations that reduced overall bag limits and limited anglers to only one fish >14 inches in the Gulkana River drainage to ensure the sustained yield of the area's wild Arctic grayling stocks (Taube 2002). In 2003, the bag and possession limit in lakes was reduced to five wild Arctic grayling with no size limit. Continued declines in harvest may reflect a general decline in areawide fishing effort since 2000 (Table 2) and increased angler preference for catch-and-release fishing.

Wild Arctic grayling are the most caught species in the UCUSMA (Table 12). Along with harvest, catch has generally declined since 1990 when catch was first monitored (Somerville 2017), but wild Arctic grayling catch, on average, contributes nearly 50% to the annual total catch of all species.

The *Wild Arctic Grayling Management Plan* (5 AAC 52.055) was adopted in 2004 and designates three management approaches: regional, conservative, and special management. Most wild Arctic grayling fisheries in the UCUSMA fall under the regional management approach and are open to fishing all year, with or without bait, and a bag and possession limit of five fish with no size limit. Under the conservative management approach the fishery is open to harvest from June 1–March 31, catch-and-release from April 1–May 31 to protect spawning fish, and may be limited to unbaited, single-hook, artificial lures and a bag and possession limit of two fish. Size limits may or may not be imposed. Four fisheries within the UCUSMA are classified under the conservative management approach; Mendeltna Creek (two fish ≥ 12 inches), Moose Lake and Our Creek in the Tazlina drainage (two fish, no size limit), and the Gulkana River upstream of Paxson Lake (two fish, only one fish ≥ 14 inches, open all year). Under these regulations, current harvest levels of wild Arctic grayling stocks in the UCUSMA are sustainable.

Gulkana River drainage Arctic grayling are managed under the regional management approach downstream of the inlet to Paxson Lake and under the conservative management approach upstream of Paxson Lake with two exceptions. In both drainage sections there is a size limit of only one fish >14 inches, which is consistent with the conservative management approach but not the regional approach. Secondly, there is no seasonal catch-and-release restriction during spawning (April 1–May 31) for the drainage section upstream of Paxson Lake, which is generally applied under conservative management.

The >14-inch restriction was applied to the Gulkana River Arctic grayling stocks in 1989 when data indicated the population supported a small proportion of large fish that were being overly exploited, and the regulation was meant to preserve that size structure (Williams and Potterville 1983). Later work verified the size structure of Gulkana River Arctic grayling and indicated that larger fish were predominantly found in the upper tributaries of the drainage and less so in the mainstem (Bosch 1995). Subsequent estimates of abundance and size structure (Gryski 2019; Schwanke and Tyers 2019) and radiotelemetry studies (Schwanke 2019; Schwanke and Bernard 2020) verified that larger Arctic grayling seek colder waters in the upper tributaries of the Gulkana River drainage during summer and early fall and only move into mainstem waters to overwinter and to access spawning streams then migrate back into upper tributaries. The upper drainage tributaries are in remote locations that greatly limit anglers from exploiting these waters and the larger Arctic grayling within the Gulkana River drainage; however, the portion upstream of Paxson Lake is more accessible.

Recent Fishery Performance

Wild Arctic grayling are harvested throughout the UCUSMA. Harvest of wild Arctic grayling has averaged 3,191 fish over the last 10 years (2009–2018) and 2,727 fish over the last five years (2014–2018; Table 11). Total harvest of wild Arctic grayling in 2019 was 2,090 fish. The Gulkana River drainage accounted for 61% of the total UCUSMA wild Arctic grayling harvest in 2019, followed by the Susitna River drainage, which accounted for 21% of the harvest.

The Gulkana River drainage averaged 38% of the total UCUSMA wild Arctic grayling harvest from 2014 to 2018 (Table 11). The Upper Susitna River drainage accounted for 32% of the harvest during this period followed by smaller tributary streams and lakes in the Upper Copper River drainage (14%) and the Tazlina River drainage (10%). Annual harvest only composes a small proportion of the annual catch of the species (Table 12). In 2019, only 6% of the total Arctic grayling catch was harvested.

Current Issues and Fishery Outlook

Overall, UCUSMA wild Arctic grayling fisheries appear sustainable. The current management strategies and regulatory regimes are within the guidelines of the management plan to manage for long-term sustained yield. As a result, it is anticipated that harvest levels of wild Arctic grayling will remain at sustainable levels.

Overall angler effort has been declining in the UCUSMA since about 2000 (Somerville 2017), and this trend is consistent with sport angler effort in the state (Table 1). Possible contributors to this trend may be regulations that are too complex or too restrictive with respect to current angler preferences, and a shift to catch-and-release versus more historic consumptive harvest. On the Gulkana River, anglers may keep five Arctic grayling with only one over 14 inches. However, current data suggest that it is unlikely those anglers will encounter many fish over 14 inches or

harvest the current bag limit. A change in this regulation may improve angler satisfaction with this fishery without detriment to the population.

Recent Board of Fisheries Actions

There are two proposals before the BOF in 2021 concerning USUCMA Arctic grayling sport fisheries. **Proposal 34** seeks to remove the >14-inch size limit in the Gulkana River drainage downstream of the inlet to Paxson Lake. **Proposal 35** seeks to move Moose Creek, a small stream flowing through Glennallen, from the regional management approach outlined in the *Wild Arctic Grayling Management Plan* to the conservative management approach by reducing the bag limit from five fish to two fish and imposing a spawning closure.

A proposal to prohibit catch-and-release fishing in the UCUSMA was submitted for the 2017 BOF meeting in Valdez. The proposal failed.

A proposal to increase the bag limit of Arctic grayling in the Gulkana River drainage to 10 fish, only five of which may be greater than 14 inches, was submitted for the 2014 BOF cycle. The proposal failed.

LAKE TROUT SPORT FISHERIES

Background and Historical Perspective

The UCUSMA is the only area in Alaska where numerous lake trout fisheries exist along the road system (Figure 4). Lake trout are harvested mainly from lakes within the Tyone River drainage (Lake Louise, Susitna and Tyone Lakes) and the Gulkana River drainage (Paxson, Summit, and Crosswind Lakes; Table 13).

Prior to 1987, the bag limit in UCUSMA waters was two lake trout ≥ 20 inches and 10 lake trout < 20 inches. Under these regulations, lake trout harvests from UCUSMA waters averaged about 7,400 fish annually (Somerville 2017). However, it was found that eight of nine lake trout populations in the Upper Copper River drainage were being harvested above sustainable levels, based on surplus production models developed from lake trout populations in Canada and the Great Lakes (Burr 1987). As a result of these findings, the bag limit for UCUSMA waters was reduced to two fish and a minimum size limit of 18 inches was adopted for Summit and Paxson Lakes, Lake Louise, and Susitna and Tyone Lakes in the Tyone River drainage in 1987. The minimum size limit was imposed to allow female lake trout to spawn once before reaching harvestable size.

In 1994, the minimum size limit for lake trout was increased from 18 to 24 inches in Lake Louise and Susitna, Tyone, Crosswind, Paxson, and Summit Lakes, and the bag and possession limit was reduced from two to one lake trout in Lake Louise and Susitna, Tyone, and Crosswind Lakes. The minimum size limit was increased to allow lake trout to reach a size where they could spawn at least once before being recruited to the fishery and to reduce the harvest to a sustainable level in Paxson and Summit Lakes. The bag limit reduction was imposed on lakes with lake trout of greater than average length to prevent effort from being concentrated on these size classes.

Following the 24 in minimum size restriction, the number of lake trout released by anglers in Crosswind, Paxson, and Summit Lakes and Lake Louise, Susitna and Tyone Lakes increased from an average of 60% released prior to the restriction (1990–1993) to an average 80% for all the years following (1994–2005). Although harvest decreased, the overall catch rate did not decrease and in many cases increased so that effective harvest (harvest plus 10% of the catch minus the harvest, to

account for hooking mortality of released fish) was still exceeding the sustainable yield levels in the larger UCUSMA lake trout fisheries.

The department initiated a regional review of lake trout regulations and management in 2002 and developed a lake trout management plan that was adopted by the BOF in 2005 (Burr 2006). Based on this review and adoption of the management plan, the minimum size limit for lake trout was removed in Paxson and Summit Lakes and the bag limit was set to one per day beginning in 2006. Additionally, the use of bait was prohibited from April 16–October 31. Bait was allowed from November 1–April 15 to provide for the burbot fishery. In 2012, these same regulations were implemented for Lake Louise, Susitna, Tyone, and Crosswind Lakes effectively aligning lake trout management in all large lakes with high angler effort and effective harvest rates that consistently met or exceeded sustainable levels. These regulation changes were intended to reduce fishing mortality below the sustainable yield estimates for these lakes.

Recent Fishery Performance

Total harvest of lake trout averaged 1,011 fish from 2014 to 2018 (Table 13) with 51% from the Susitna River drainage and 33% from the Gulkana River drainage. Lake Louise (28%), Paxson (16%), and other Susitna (15%) lakes accounted for over half the annual average lake trout harvest in the UCUSMA during those same five years. The harvest of 553 lake trout from the UCUSMA in 2019 was approximately half of the five- and 10-year averages and was the lowest overall harvest since 1977 (Somerville 2017). Similar to Arctic grayling, most anglers sport fishing for lake trout release their catch. In 2019, lake trout harvest was only 7% of the annual catch of the species. Although effort has increased significantly over the last two years on area lakes and especially lakes in the Susitna River drainage (Table 2), harvest and catch of lake trout is declining. Because all lake trout stocks appear to be stable, observed angler catch rates and satisfaction appear good, and winter weather has been comparatively mild, it is difficult to determine what is driving the current trend in lake trout harvest and catch.

Current Issues and Fishery Outlook

Management of lake trout populations in the UCUSMA has been guided by the *Wild Lake Trout Management Plan* (5 AAC 52.060) since 2006 (Burr 2006) and the department uses the Lake Area Model (Evans et al. 1991) as a conservative guideline to determine sustainable harvests of lake trout from area lakes. The Lake Area model provides a general guideline for sustainable harvests but is based on a relatively small range of mostly southern Canadian lakes and their observed sustainable yields. Therefore, the predicted annual yields are inherently imprecise (Burr 2006). The potential yield given by the Lake Area model is treated as a threshold that should not be exceeded rather than a strict target level of exploitation.

Reduced bag limits, prohibition of bait during the open water period, and removal of the size limit have reduced effective harvest in Lake Louise, Susitna, Tyone, Crosswind, Paxson, and Summit Lakes to sustainable levels (Table 13). However, in some lakes there is a small margin between current harvest and the maximum sustainable harvest. If effort increases, it may be necessary to further restrict some of these lake fisheries.

Although the Lake Area Model adequately protects lake trout populations from over exploitation, it may result in overly restrictive management of lake trout fisheries in the UCUSMA. Region III Sport Fish staff have begun a review of an updated yield model for lake trout (Lester 2021) based on a substantially larger sampling of lakes and including lakes in latitudes similar to Alaska. If

higher harvest levels appear to be sustainable, some liberalization in lake trout regulations may be possible, which may help increase angler effort in the UCUSMA.

Lake trout populations within the UCUSMA are currently managed conservatively. All populations are considered healthy and the fisheries sustainable under current regulations.

Recent Board of Fisheries Action

There is one proposal before the BOF in 2021 concerning UCUSMA lake trout sport fisheries. **Proposal 36** seeks to increase the bag limit for lake trout in Crosswind Lake and implement an annual limit of one fish over 30 inches.

A proposal to prohibit catch-and-release fishing in the UCUSMA was submitted for the 2017 BOF meeting in Valdez. The proposal failed.

No proposals concerning area lake trout fisheries were submitted to the BOF for the 2014 board cycle.

WILD RAINBOW AND STEELHEAD TROUT SPORT FISHERIES

Background and Historical Perspective

The Upper Copper River drainage rainbow and steelhead stocks are the northernmost extent of the species' natural range in North America. The area's widely distributed stocks of wild rainbow and steelhead trout display generally low population size and overall productivity with little ability to sustain harvests. To ensure that these stocks are not overexploited, a conservative regulation plan was developed and implemented in several Upper Copper River drainages to manage the fisheries targeting these stocks. This plan was guided by the *Upper Cook Inlet and Copper River Basin Rainbow/Steelhead Trout Management Policy* (CISFPT Unpublished).¹

In 1988, the waters of Lower Hanagita Lake and the Hanagita River from Lower Hanagita Lake to the Tebay River were restricted to catch-and-release for rainbow/steelhead trout. In 1990, the Gulkana River drainage fishery was restricted to catch-and-release. In 2005, the remainder of the Hanagita River drainage (upstream of Lower Hanagita Lake) and the Tebay River downstream of the Hanagita River confluence were included in the area closed to the retention (catch-and-release only) of rainbow/steelhead trout. Regulations restricting waters supporting rainbow/steelhead trout to only unbaited, single-hook, artificial lures were adopted for the flowing waters of Tebay River drainage in 1988, all flowing waters of the Gulkana River drainage above a point on the mainstem Gulkana River 7.5 miles upstream of the confluence of the West Fork in 1990, and for all flowing waters of the UCUSMA in 1999. Spawning closures were established around the identified rainbow/steelhead trout spawning areas on the Middle Fork of the Gulkana River in 1997 and Twelvemile Creek (a tributary of the Gulkana River) in 2003. Additionally, the retention of rainbow or steelhead trout incidentally caught was prohibited in the Copper River Personal Use Dip Net Salmon Fishery (Chitina Subdistrict) in 1997, and then in 2003, for rainbow trout or steelhead trout caught by dip net in the subsistence salmon fishery (Glennallen Subdistrict).

Stock assessment of the Gulkana River rainbow trout population was initiated in 2004. The project objective was to estimate abundance of rainbow trout from Paxson Lake to two miles downstream of Sourdough; an index area 79 km long. Feasibility work was conducted in August and September

¹ CISFPT (Cook Inlet Sport Fishing Team and The Division of Sport Fish). *Unpublished*. Cook Inlet and Copper River basin rainbow/steelhead trout management policy. Alaska Department of Fish and Game. Adopted by Alaska Board of Fisheries, 1986.

of 2004 and a mark–recapture study was conducted in 2005 (Schwanke and Taras 2009). The abundance of rainbow trout ≥ 11 in (275 mm FL) was 5,238 fish (SE = 689; 95% CI = 3,888–6,588), and for rainbow trout 6–11 in (160–274 mm FL) was 6,850 fish (SE = 1,023; 95% CI = 4,845–8,855). A radiotelemetry study was conducted on rainbow trout in the Gulkana River beginning in 2009. Approximately 100 rainbow trout were tagged and tracked. Previously undocumented spawning areas were identified in the West Fork Gulkana and Gulkana River Mainstem above the confluence with the West Fork (Schwanke 2015).

A project to determine steelhead trout distribution using radiotelemetry was conducted in the Upper Copper River from 2004 to 2006. Feasibility work was conducted in September 2004 and the full project was conducted during fall 2005 and 2006 (Savereide 2005b, 2005c, 2008). Radiotagged fish migrated into the mainstem Chitina (26%), Tazlina (47%), and Gulkana (27%) Rivers. The study was discontinued after its second year due to the difficulty in capturing and tagging more than 100 fish, which was the minimum sample size necessary to meet the statistical criterion of the study.

Summit Lake within the Tebay drainage is unique because rainbow trout are the only species present and have shown a tendency to become highly stunted because of intraspecific competition (Fleming 2000). Test netting, hook-and-line sampling, and visual surveys from 1982 to 1985 showed that these waters once contained the largest nonanadromous rainbow trout in the Copper River drainage, with individual fish measuring over 32 inches in length and weighing up to 20 pounds (Williams and Potterville 1985). Current regulations (10 fish bag limit with only one over 18 inches) are intended to promote growth and a population size structure with higher portion of fish over >18 inches.

All other waters supporting wild rainbow/steelhead trout stocks are managed under a two-fish bag limit of which only one fish may be ≥ 20 inches. The season is year-round with the exception of the spawning closure (April 15–June 14) on the Middle Fork Gulkana River and Twelvemile Creek.

In 2003, the BOF adopted a statewide *Policy for the Management of Sustainable Wild Trout Fisheries* (5 AAC 75.222). This policy provides guidelines to the BOF and ADF&G for developing regulations and managing wild trout populations.

Recent Fishery Performance

A total of 64 wild rainbow trout were reported harvested from the UCUSMA in 2019, which is below the 2014–2018 average of 113 fish but near the 10-year average of 71 fish (Table 3). The largest wild rainbow trout fishery in the UCUSMA continues to be the Gulkana River, which is limited to catch-and-release only. The Gulkana River accounts for the majority of rainbow trout caught in the UCUSMA making up 69% of the catch over the past five years (2012–2016). The overall catch of 2,115 wild rainbow trout in 2019 is consistent with the recent five- and 10-year average catches (Table 14). No steelhead trout have been reported as harvested in the UCUSMA since 1999, and no catch was reported in 2019. Historic trends in the area’s wild rainbow/steelhead fisheries are difficult to ascertain, because annual harvest and catch estimates have been small and fluctuate markedly.

Current Issues and Fishery Outlook

Rainbow trout and steelhead trout populations and distribution in the UCUSMA are still not fully understood. Some populations may yet be unidentified and may be reported through the SWHS periodically.

With adoption of more restrictive regulations, particularly in the Gulkana River drainage, harvests of rainbow trout have declined from the historic ranges of 2,000 or more fish (Somerville 2017). Wild rainbow and steelhead trout populations should remain at low, but sustainable levels into the foreseeable future. Although rainbow and steelhead trout can be found in the Tonsina, Klutina, and Tazlina drainages, there are no fisheries in the UCUSMA that attract anglers specifically targeting rainbow and steelhead trout other than the Gulkana, Tebay, and Hanagita River drainages and sometimes Kiana Creek (tributary to Tazlina Lake).

That said, the rainbow and steelhead trout stocks of the Gulkana River and other drainages in the UCUSMA appear to be healthy and sustainable under current area regulations. Proposals for allowing some level of consumptive harvest of rainbow trout in the Gulkana River assume the size of that population has increased to levels that can sustainably support harvest. However, the limited population and catch data available do not support this assumption. Furthermore, current data on the Gulkana River rainbow and steelhead trout are inadequate for determining what, if any, level of sustainable harvest is possible and what kinds of regulations would be needed to ensure harvest levels can remain sustainable within known and future levels of angler effort.

Recent Board of Fisheries Actions

There are two proposals before the BOF in 2021 that concern UCUSMA rainbow/steelhead trout sport fisheries. **Proposals 32 and 33** seek to allow a harvest bag limit of one fish over either 18 or 20 inches in the Gulkana River.

A proposal to prohibit catch-and-release fishing in the UCUSMA was submitted for the 2017 BOF meeting in Valdez. The proposal failed.

In 2014, the BOF adopted an ADF&G proposal to simplify and align current regulations for Summit Lake in the Chitina River drainage with its outlet stream Bridge Creek.

UPPER COPPER RIVER PERSONAL USE FISHERY

Background and Historical Perspective

In 1968, the Copper River subsistence fisheries were divided into two separate fisheries. One fishery occurred below the Million Dollar Bridge at Miles Lake and consisted of a gillnet fishery in saltwater occurring prior to the commercial fishery. The second fishery, designated the Upper Copper River District (UCRD), was limited to the Copper River mainstem from the confluence of the Slana River downstream to a gauging station cable crossing located 1¼ miles below O'Brien Creek. In 1977, the UCRD was divided into the Chitina Subdistrict (CSD), which extended from the downstream edge of the Chitina-McCarthy Bridge to 200 yards upstream of Haley Creek (the current downstream boundary of the UCRD) and the Glennallen Subdistrict (GSD) from the confluence of the Slana River to the Chitina McCarthy Bridge. The upper and lower boundaries of the CSD changed several times after 1977, but since 1991 the boundary has remained from the downstream edge of the Chitina-McCarthy Bridge to a line approximately 200 yards upstream of Haley Creek and is designated by a pair of ADF&G markers.

Beginning in 1984, the CSD was designated a personal use fishery. Personal use fisheries, unlike subsistence fisheries, do not have a priority over other fisheries and may be restricted to ensure subsistence needs are met or escapement goals achieved. Personal use fisheries differ from sport fisheries in both their objectives and management. Both fisheries provide Alaskans the opportunity to harvest fish for personal consumption (in either, fishery fish cannot be sold or bartered), but personal use fisheries are managed to maximize harvest potential, whereby sport fisheries are managed to provide diversity of opportunity. Anyone can participate in Alaska's sport fisheries (provided they have a sport fishing license), but only Alaska *residents* may participate in personal use fisheries (provided they also have a sport fishing license and a permit, if required, for the personal use fishery). The Division of Sport Fish manages most of the state's freshwater personal use fisheries, whereas the Division of Commercial Fisheries manages most of the subsistence fisheries and saltwater personal use fisheries. However, the GSD subsistence fishery in the UCRD is managed by the Division of Sport Fish.

The BOF established the *Copper River Personal Use Dip Net Salmon Fishery Management Plan* in 1984, which divided the inriver allocation of salmon into subsistence harvest, personal use harvest, sport fishery harvest of sockeye and king salmon, hatchery broodstock, and specific spawning escapement goals for sockeye, king, and other salmon. The BOF apportioned 60,000 salmon for the Chitina Subdistrict personal use fisheries at that time.

The annual limits per household were set at 10 salmon for a permit issued to a household of one, and 25 salmon for a household of two or more in 1984. The BOF changed these limits in 1989 to 15 salmon for a household of one and 30 salmon for a household of two or more, with the stipulation that only five of the 15 or 30 fish limits could be king salmon.

At its 1996 meeting, the BOF adopted changes to the *Copper River Personal Use Dip Net Salmon Fishery Management Plan*, moving the inriver salmon apportionment guidelines from the personal use plan to the *Copper River District Salmon Management Plan* within Commercial Fisheries regulations. The BOF also increased the personal use apportionment to 100,000 salmon and in conjunction with the creation of the *Copper River King Salmon Management Plan* (5AAC 24.361), the allowable limit of king salmon in the CSD was reduced from five to four fish. An Agenda Change Request (ACR) was submitted in 1998, and the BOF subsequently added two stipulations within the personal use plan. The first created supplemental periods allowing permit holders to harvest an additional 10 sockeye salmon when there was a harvestable surplus of 50,000 or more salmon present in the CSD. The second stipulation stated that "If the Copper River District commercial salmon fishery is closed for 13 consecutive days, the maximum harvest level in the Chitina Subdistrict is reduced to 50,000 salmon."

In 2000, when the BOF adopted a positive customary and traditional use determination (C&T), the CSD again became a subsistence fishery. The BOF established an amount necessary for subsistence (ANS) of 85,000–130,000 wild salmon for the CSD while maintaining the ANS for the GSD at 60,000–75,000 salmon, for a total subsistence ANS for the UCRD of 145,000–205,000 salmon. The BOF also reduced the limit for king salmon in the CSD from four to one fish. When the BOF reversed its positive C&T in 2003, the CSD changed back to a personal use fishery and the BOF increased the number of salmon apportioned to this fishery within the inriver goal to a range of 100,000–150,000 salmon (included wild and hatchery sockeye salmon) but left the king salmon annual limit at one fish.

In 2014, the BOF increased the annual limit of salmon in the CSD to 25 salmon for the head of household and 10 additional salmon for each additional household member with only one of the annual limit being a king salmon. Additionally, the BOF removed the supplemental periods from the *Copper River Personal Use Dip Net Salmon Fishery Management Plan*. In 2017, the BOF removed the stipulation that if the Copper River District commercial salmon fishery is closed for 13 consecutive days, the maximum harvest level in the Chitina Subdistrict is reduced to 50,000 salmon.

Currently, all Alaska residents are eligible to participate in the CSD personal use dip net salmon fishery. The fishery is opened each year by emergency order (EO) between June 7 and June 15 and opened each week thereafter by EO through August 30. The fishery is open from September 1 to September 30 by regulation. Both a valid Alaska sport fishing license and a personal use permit are required to participate in the fishery. Users must record their harvest on their permit prior to leaving the fishing site and return the permit when they are done fishing for the season or by October 15. The limits are 25 salmon for the head of household and 10 additional sockeye salmon for each additional household member. Only one salmon of the annual limit may be a king salmon. Only dip nets may be used to harvest salmon in this fishery. The BOF has mandated that a household may not be issued both a GSD subsistence salmon fishing permit and a CSD personal use salmon fishing permit in the same year.

Management of the Chitina Subdistrict personal use dip net fishery is guided by the *Copper River Personal Use Dip Net Salmon Fishery Management Plan* (5 AAC 77.591). The Chitina Subdistrict personal use dip net fishery is managed weekly based on the abundance of salmon passing the sonar counter at Miles Lake (Figure 2). The fishery is opened for up to 168 hours each week based on the number of salmon counted past the sonar and the previous three- to five-year average of harvest per hour for that calendar week. Time restrictions each week manage the harvest of sockeye salmon in this fishery. However, additional management action may be taken to ensure the Copper River escapement goals for sockeye and king salmon are met. For king salmon, this can only be accomplished by prohibiting retention in the fishery in some portion of the first six weeks of the fishery. Generally, 60% of the king salmon harvest in the CSD occurs by the end of June and 80% by the middle of July. For sockeye salmon, additional restrictions on fishing time, beyond that calculated from actual passage at the sonar, may be implemented to reduce harvest.

From 1991 to 1999, a fee of \$10 was attached to the permit, and from 2000–2003, the permit fee was \$25. A portion of this fee was paid to Ahtna and Chitina Native Corporations for access across their lands. The permit fee was discontinued after 2003 and both corporations established their own access fee program for access across their lands. In 2016, the Alaska legislature approved a \$15 fee for the CSD personal use permit beginning with the 2017 fishing season. Revenues from this fee are used for trail maintenance, garbage removal, and construction and maintenance of pit toilets at several locations.

Since 1984, harvests have been dominated by sockeye salmon (95%) and king salmon (3%) (Somerville 2017). Sockeye harvests have increased and tracked with the number of permits issued. From 1984 to 1988 an average of 41,200 sockeye salmon were harvested in the fishery compared to an average of 149,889 sockeye salmon over the last five years (2014–2018; Table 15). The number of permits issued in this fishery averaged 4,419 from 1984–1988 and averaged 10,044 from 2014–2018. King salmon harvest has also tracked with the number of permits issued in this fishery through 1999 with an average of 2,284 king salmon harvested from 1984 to 1988 compared with an average of 5,275 king salmon harvested from 1995 to 1999 (Somerville 2017). The BOF

reduced the annual limit for king salmon in the CSD from four to one fish when it designated this fishery a subsistence fishery in 2000 and kept this limit when the fishery returned to a personal use fishery in 2003. Average harvest of king salmon from the CSD has since been about 2,500 king salmon and no longer tracks with the number of permits issued or fished. King salmon returns were below average from 2009 to 2019, requiring prohibition of king salmon retention in the CSD at various times (Table 5) resulting in an average harvest of 1,130 king salmon during those years (Table 15). The fishery remained unrestricted in 2015, 2018, and 2019, but the king salmon harvest was still below average at 1,883 fish for those three years.

Recent Fishery Performance

In 2019, the Chitina Subdistrict personal use fishery season was opened, by EO, on June 7 and remained open, continuously, for the duration of the season (Appendix A1). Additionally, king salmon retention was allowed in the personal use fishery for the entire season.

A total of 8,071 permits were issued for the Chitina Subdistrict personal use fishery in 2019 (Table 15). Although the number of permits issued was below average, the fishery had its highest participation rate since 2001, with 67.7% of permits fished. Total harvest from the personal use fishery for 2019 was 175,487 salmon, which was the third largest harvest since 2000 (Table 15) and approximately 16% larger than the previous five-year average harvest. The high harvest in the personal use fishery in 2019 is attributed to the large upriver return of sockeye salmon (Table 9) and the historic low flow river conditions conducive to dipnetting in the subdistrict. Additionally, the strong inriver return of king salmon, coupled with unrestricted fishing times, allowed for the second highest king salmon harvest in the personal use fishery since 2007.

In 2020, the Chitina Subdistrict personal use fishery was restricted for most of the season due to the poor sockeye and king salmon returns. Although sonar counts remained 1,330–49,151 fish below weekly expected passage, and cumulative sonar passage indicated the lower bound sockeye salmon goal may not be reached, some fishing opportunity was allowed each week through the eighth week of the season. In all these weeks, with the exception of weeks two, four, and five, the fishing time was restricted beyond what the *Chitina Subdistrict Personal Use Dip Net Fishery Management Plan* would normally provide based on the number of fish passing the sonar in a given week. Over the season, the CSD fishery was closed an additional 268 hours through June and July and fully closed during the month of August when normally the fishery is open seven days a week.

The 2020 Chitina Subdistrict personal use fishery season was opened, by EO, on June 7 for a 24-hour fishing period. Salmon passage past Miles Lake sonar was below projection through June 14 and consequently, each week's fishing period was reduced from the preseason schedule. This resulted in a 84-hour fishing period the week of June 8, a 120-hour period the week of June 15, and a 138-hour period the week of June 22 (Appendix A1). Also beginning June 22, king salmon retention in the personal use fishery was prohibited due to the king salmon run being substantially weaker than forecasted. This closure was justified because the commercial harvest of king salmon, king salmon catches and recapture rates at the Native Village of Eyak research fish wheels, and the king salmon counts at the Gulkana River counting tower were all below average, which in combination raised concerns that the lower end of the king salmon escapement goal may not be achieved.

Miles Lake sonar passage improved the week of June 15 and more fish than projected passed into the system and the personal use fishery was open 168 hours for the week of June 29

(Appendix A1). Although sonar passage improved and continued above projection through July 12, total salmon passage at Miles Lake sonar remained below the inriver objective and the commercial harvest of sockeye salmon was 89% below average. The personal use fishery was restricted to 84-hour fishing periods for the weeks of July 6 and July 13, and a 72-hour period the week of July 20. Sonar passage never improved to the magnitude needed to make up for the salmon deficit and due to concerns of not achieving the sockeye salmon escapement goal, the personal use fishery was closed from July 27 through August 31. The fishery re-opened by regulation on September 1 through September 30.

A total of 6,825 permits were issued for the Chitina Subdistrict personal use fishery in 2020. This is a 15% decrease in the number of permits issued in 2019 and approximately 30% below the five- and 10-year averages. The drop in permits likely resulted from restricted fishing times throughout June and July and the complete closure of the fishery from the last week in July through all of August (Appendix A1), coupled with the COVID-19 pandemic that discouraged travel between communities. The 2020 personal use fishery harvest estimate has not yet been finalized but it is anticipated to be near 83,000 salmon.

Current Issues and Fishery Outlook

Access to the Chitina Subdistrict personal use fishery is just as much of an issue as it is with area sport fisheries. Currently, public access is allowed where 300-foot-wide ROWs for the Copper River Highway and McCarthy Road extend to the Copper River. Most of the land outside of the ROWs is owned by the Chitina Native Corporation (CNC) or Ahtna Native Corporation. Access across these lands is allowed with payment of a daily or annual fee paid directly to the corporations. Lack of facilities and cramped camping and parking creates social conflicts between users and between users and the local community.

The personal use fishery accounts for an average (2009–2018) of about 10% of the overall Copper River sockeye salmon harvest but still represents the second largest fishery next to the Copper River District commercial fishery and followed by the Glennallen Subdistrict subsistence fishery (5%; Table 9). Copper River sockeye and king salmon runs are expected to remain depressed into the foreseeable future and will likely demonstrate continued high interannual variations in run strength. The CSD personal fishery may see decreased fishing opportunity compared historic trends. Additionally, as stocks decline, allocation between the three major salmon fisheries may become more contentious, pitting each user type against the others.

Recent Board of Fisheries Actions

Ten proposals have been submitted for consideration by the BOF in 2021 that relate to the CSD salmon fishery:

Proposal 8: Prohibit dipnetting near tributary mouths of the Upper Copper River District.

Proposal 10: Prohibit dipnetting from a boat in the Upper Copper River District.

Proposal 11: Prohibit dipnetting from a moving boat in a portion of the Chitina Subdistrict.

Proposal 12: Prohibit dipnetting from a boat when within 50 feet of a person dipnetting from shore in the Chitina Subdistrict.

Proposal 15: Prohibit the use of gillnet mesh in dip nets.

Proposal 16: Prohibit the use of depth or fish finders on boats in the Upper Copper River District.

Proposal 18: Extend the lower boundary of the Chitina Subdistrict downstream ½ mile.

Proposal 19: Reduce the maximum harvest level in the Chitina Subdistrict Personal Use Fishery when the Copper River commercial fishery harvest is 50% below the 10-year average on June 1.

Proposal 20: Amend the annual limit for salmon in the Chitina Subdistrict.

Proposal 21: Amend the opening date of the Chitina Subdistrict personal use fishery from June 7 to June 1.

Four proposals were submitted for consideration at the 2017 BOF meeting in Valdez that concerned the CSD personal use fishery. One proposal to remove the automatic reduction to the maximum harvest limit when the Copper River District commercial fishery is closed for 13 or more consecutive days was carried. Proposals to extend the lower boundary of the CSD, prohibit the use of monofilament netting in dip nets, and to require logbooks for transporters and guides in the fishery failed.

Ten proposals were submitted for consideration during the 2014 BOF cycle for the UCUSMA subsistence and personal use fisheries combined. The BOF carried a proposal specific to the Glennallen Subdistrict providing EO authority for ADF&G to establish an annual bag limit for king salmon taken by fish wheel, modify the annual limit for king salmon taken by dip net, and to modify methods and means in the subsistence fishery to reduce harvest of king salmon. The BOF also carried a proposal changing the annual limit in the Chitina Subdistrict personal use dip net fishery to 25 plus 10 additional salmon per household member and repealed the supplemental harvest periods. Proposals not adopted included: (1) prohibit the use of monofilament webbing in dip nets, (2) require that king salmon be kept in the water prior to release, (3) establish a check station in Chitina for harvest reporting in both the Glennallen and Chitina subdistricts, (4) open the Chitina Subdistrict six days earlier, (5) repeal the 13 day commercial closure trigger for lowering the maximum allowable harvest in the Chitina Subdistrict, (6) establish a 3,000 fish allocation of king salmon in the Chitina Subdistrict, (7) require charter operators to maintain daily logbooks and record client harvests; and, (8) reduce the maximum harvest to 100,000 salmon in the Chitina Subdistrict.

UPPER COPPER RIVER SALMON SUBSISTENCE FISHERIES

Background and Historical Perspective

Glennallen Subdistrict Subsistence Salmon Fishery

When the BOF first adopted the *Copper River Subsistence Salmon Management Plan* in 1978, it directed the department to manage the Copper River to “ensure that an adequate escapement reaches the spawning grounds and provide for a sport and subsistence harvest of any surplus”. In 1984, this language was changed to “ensure that an adequate escapement reaches the spawning grounds and provide for hatchery broodstock, and for subsistence, personal use, and sport fisheries”. The BOF designated within the subsistence management plan a specific number of salmon needed to ensure adequate escapement. Within the *Copper River Personal Use Dip Net Salmon Fishery Management Plan* that number was further broken down into specific spawning escapement of sockeye and king salmon, subsistence harvest, personal use harvest, sport fishery harvest of sockeye and king salmon, and hatchery broodstock. In 1984, the BOF apportioned 20,000 salmon as an adequate amount for the Glennallen Subdistrict subsistence fisheries and 60,000 salmon for the Chitina Subdistrict personal use fisheries. In 1985, the subsistence apportionment increased to 25,000 salmon and remained at this level until 1991 when it was increased to 35,000 salmon.

The state legislature passed a new subsistence statute in 1992 that maintained the requirement that subsistence uses be “customary and traditional” and that they retained priority over all other uses. This legislation also required the BOF to establish amounts necessary for subsistence (ANS) when designating a fishery as subsistence. An ANS acts as a metric to measure a subsistence fishery but imparts no inseason management responsibility on the department to ensure achievement of the ANS or that harvest does not exceed the ANS. The BOF may revisit an ANS if a subsistence fishery grows or changes in some fundamental way. The BOF established a 35,000 salmon ANS for the GSD subsistence fishery in 1992.

At its 1996 meeting, the BOF adopted changes to the *Copper River Personal Use Dip Net Salmon Fishery Management Plan*, moving the inriver salmon apportionment guidelines from the personal use plan to the *Copper River District Salmon Management Plan* within Commercial Fisheries regulations. The BOF also increased the subsistence ANS to a range of 60,000–75,000 salmon.

During the 2005 BOF meeting in Valdez, subsistence users fishing the upper reaches of the GSD expressed concern that too few salmon were escaping the personal use and subsistence fisheries in the vicinity of Chitina. To address these concerns, the BOF divided the GSD into subareas from the Chitina-McCarthy Bridge to the Tonsina River, the Tonsina River to the Gakona River, and from the Gakona River to the Slana River. The Chitina-McCarthy Road Bridge to Tonsina River subarea was assigned an ANS of 25,500–39,000 salmon, the Tonsina River to Gakona River subarea an ANS of 23,500–31,000 salmon, and the Gakona River to Slana River subarea an ANS of 12,000–12,500 salmon. These ANS numbers were based on the three highest reported harvests (both federal and state) from each subarea between 2000–2004. The total ANS for the GSD was 61,500–82,500 salmon and this range was added because the 2006 subsistence apportionment in the Copper River inriver goal and has not changed since.

Participation has steadily increased in the UCRD subsistence fishery since 1960 (Somerville 2017). From 1960 to 1964, an average of 498 total permits were issued for the UCRD compared to an average of 1,669 permits issued over the last five years (2014–2018) for the GSD alone (Table 16). Prior to the removal of the CSD from the subsistence fishery in 1984, total subsistence permits issued peaked at 7,541 permits in 1983, with only 630 of those permits for the GSD. For the three years 2000–2002, when the CSD was again designated as a subsistence fishery, the total number of subsistence permits issued in the UCRD peaked at 10,697 permits in 2001 with 832 fish wheel and 407 dip net permits issued for the GSD.

In the GSD, the number of fish wheel permits issued each year peaked at 847 permits in 1997 and averaged 794 permits from 1997–2001 (Somerville 2017). After 2001, the number of fish wheel permits issued has generally declined to a low of 347 in 2018 (Table 16). During this same period, the number of dip net permits issued for the GSD rose to a high of 1,354 in 2019. This shift reflects changes in local demographics decreasing the number of fish wheels in the GSD and especially to a shift in the flow of the Kotsina River that has adversely impacted the access to fish wheels directly upstream of the Chitina-McCarthy Bridge. Secondly, inseason management actions (Table 5) closing the personal use fishery in the CSD to the retention of king salmon has caused some users of that fishery to shift their effort to the subsistence fishery instead.

All Alaska residents are eligible to participate in the Glennallen Subdistrict subsistence salmon fishery with either fish wheels or dip nets. The season is open from June 1 through September 30, unless closed by emergency order. Only Alaska residents may participate in a subsistence fishery. A free subsistence permit is required to participate in the fishery. Users must record their harvest

daily on their permit prior to leaving the fishing site and return the permit upon completing fishing for the season. The annual limits are 30 salmon for a household of one, 60 salmon for a household of two, and 10 salmon for each additional person in a household of more than two people. Individuals may request additional salmon up to a maximum of 200 salmon and households of two or more may request up to 500 salmon. For people using dip nets, only five fish of the annual limit may be king salmon.

Subsistence harvests are dominated by sockeye salmon (96%) and king salmon (3%; Table 16). Subsistence harvest of sockeye salmon has steadily increased since 1960 and closely track with changes in total permits issued (Somerville 2017). From 1960 to 1964, an average of 16,314 sockeye salmon were harvested in the UCRD compared to an average of 80,255 harvested over the last five years (2014–2018) in the GSD alone. Prior to the removal of the CSD from the subsistence fishery in 1984, total sockeye salmon harvest peaked at 110,794 fish in 1983 with 37,596 sockeye salmon from the GSD. For the 3 years, 2000–2002, when the CSD was again designated as a subsistence fishery, the total sockeye harvest in the UCRD peaked at 215,895 fish in 2001, with 83,787 sockeye salmon coming from the GSD.

King salmon harvests rose from 1960 through 2002 and tracked with the number of permits issued in each subdistrict up until about 2003 (Somerville 2017). After 2003, king salmon harvest in the GSD stabilized and declined as the number of fish wheel permits decreased while the number of dip net permits greatly increased. Households fishing with dip nets in the GSD are limited to five king salmon per year and have an average harvest of just under two king salmon per permit, whereas households fishing under a fish wheel permit may harvest king salmon up to their total annual limit and average about five king salmon per permit. From 1960 to 1964, an average of 668 king salmon were harvested in the UCRD compared to an average of 3,581 harvested over the last five years (2014–2018) in the GSD alone (Table 16). Prior to the removal of the CSD from the subsistence fishery in 1984, total king salmon harvest peaked at 5,950 fish in 1983 with 1,275 king salmon from the GSD. For the three years, 2000–2002, when the CSD was again designated as a subsistence fishery, the total king salmon harvest in the UCRD peaked at 8,024 fish in 2000, with 4,856 king salmon coming from the GSD.

Batzulnetas Subsistence Salmon Fishery

When the State of Alaska limited subsistence salmon harvest to the mainstem of the Copper River downstream of the confluence of Slana River in 1964, several traditional fishing sites on the Tonsina and Klutina Rivers, and on the Copper River upstream of the Slana River and Tanada Creek were prohibited. One of these sites consisted of the waters of the Copper River upstream of the Slana River and a portion of Tanada Creek, known as Batzulnetas by the Ahtna people, was used as a traditional fish camp by people originally from Mentasta Village, and in particular, by the families of Katie John and Doris Charley. In 1984, Katie John and Doris Charley presented a proposal to the BOF to allow subsistence fishing at the traditional location. The proposal failed, and the following year, the Native American Rights Funds filed a lawsuit on behalf of Katie John under Title VIII of ANILCA to compel the State to reopen the historic Batzulnetas fishery. The legal battle that ensued lasted through 2015. However, several actions and legal decisions during the ensuing years affected management not only of the Batzulnetas fishery, but the Upper Copper River fisheries, and all subsistence fisheries in the state as well. The BOF adopted regulations allowing for a subsistence fishery at Batzulnetas at its 1987 meeting. Beginning in 1988, salmon, other than king salmon, could be taken in the Copper River between ADF&G regulatory markers near the mouth of Tanada Creek and approximately 1.5 miles downstream from the mouth and in

Tanada Creek between regulatory markers identifying the open waters of the creek. A Batzulnetas Subsistence permit was required, and allowable gear was limited to fish wheels and dip nets in the Copper River and dip nets and spears in Tanada Creek. The fishery was open 2 days per week in June and 3.5 days per week in July and August, and annual limits were the same as in the GSD. The fishery was further restricted to only residents of Dot Lake and Mentasta Village, but this restriction was removed after the 1989 McDowell decision.

Despite the State of Alaska opening a fishery at Batzulnetas, the litigants believed the fishery was too restrictive and continued the legal case petitioning the federal government to intercede under provisions within ANILCA. Beginning in 1999, the federal government assumed management authority over subsistence fishing in navigable waters of Alaska adjacent to or within federal lands. This included the Copper River, which has since been under dual management for subsistence fishing with federally qualified rural residents able to get a federal subsistence permit in the CSD, the GSD, and the Batzulnetas Subsistence Area fishery. Because the western boundary of the Wrangell St. Elias National Park encompasses both the eastern and western shores of the Copper River upstream of Indian Creek, the federal government does not recognize state issued subsistence permits in the GSD upstream of Indian Creek and in the Batzulnetas Subsistence area. However, if non-federally qualified state residents were to request a state subsistence permit for these waters, one would be issued.

Under state management, subsistence users have harvested salmon from the Batzulnetas fishery since 1987 when 22 sockeye salmon were reported harvested (Somerville 2017). Harvest was again reported between 1993 and 1999 with an average annual harvest of 320 sockeye salmon and a range of 0–997 salmon during those 7 years. No Batzulnetas permits were requested in 2000. Beginning in 2001, Batzulnetas permits were issued through the NPS with participation limited to residents of Dot Lake and Mentasta Village. Under federal regulation, participants could use fish wheels, dip nets and rod and reel in the Copper River and dip nets, spears, rod and reel, and fyke nets (after consultation with NPS biologists) in Tanada Creek. The fishery is open continuously from May 15 through September 30 and the limits are the same as in the GSD. Under federal management, Batzulnetas subsistence participants have harvested an average of 140 sockeye salmon annually 2001–2014 with a range of 0–867 salmon. No Batzulnetas permits were requested in 2015.

Federal Subsistence Salmon Fishery

A stipulation within the 1980 Alaska National Interest Lands Conservation Act (ANILCA) legislation requires that fisheries and wildlife managed for subsistence must provide a rural priority. The UCRD subsistence fisheries were managed with a rural priority beginning in 1982. However, providing a rural priority in this and other subsistence fisheries was found, in the McDowell decision, to violate provisions in the Alaska Constitution, which requires equal opportunity for all Alaska residents to subsistence hunting and fishing. Several attempts were made by the state legislature and governor to meet the rural priority requirements of ANILCA, but all failed. In 1999, the United States Fish and Wildlife Service assumed management of the Copper River subsistence fisheries in all waters within or adjacent to federal lands such as the Wrangell St. Elias National Park. At first, the federal system adopted the state regulations and because federal and state regulations were identical, both federal and state subsistence users participated in the fisheries under the state subsistence permit. In 2001, federally qualified subsistence users were able to begin fishing on May 15 in the GSD. Federal subsistence limits remained identical to state limits so federal subsistence users still fished under state subsistence permits. In 2002, the Federal

Subsistence Board established a federal subsistence fishery in the CSD with an annual cumulative limit of 200 salmon for a household of one and 500 salmon for a household of two or more for both the Chitina and Glennallen subdistricts. Federal subsistence users were also able to participate in both fisheries, whereas state subsistence users were required to select either the CSD or GSD in which to participate. As a result, the National Park Service (NPS) issued separate federal subsistence fishing permits to federally qualified subsistence users beginning in 2002 (Appendices B1 and B2). Although this change did not affect overall subsistence harvest from the Copper River, the number of state permits issued decreased after 2001 (Table 11), with at least a portion of the federally qualified residents opting for a federal rather than state permit. Over the last five years (2014–2018) harvest under federal permits accounted for an average of 1.0% of the total harvest in the CSD and 26% in the GSD.

Recent Fishery Performance

Glennallen Subdistrict Subsistence Salmon Fishery

A total of 1,713 state subsistence permits were issued for the Glennallen Subdistrict in 2019 (Table 16), which was the second highest number of permits issued for the Glennallen Subdistrict since 2000. Of the permits issued, 67.6% were fished in 2019. Total harvest from the Glennallen Subdistrict state subsistence fishery for 2019 was 63,920 salmon and the total fishery harvest over the last 10 years (2009–2018) has averaged 65,306 salmon and 62,558 salmon over the last five years (Table 16). The fishery was open continuously for the duration of the season and based on the large passage of salmon at Miles Lake sonar, a higher harvest in this fishery was anticipated for 2019. However, historic low Copper River flows through June, followed by high water in July, limited the success of subsistence fishers in the Glennallen Subdistrict, especially fish wheel users.

A total of 1,665 permits were issued for the Glennallen Subdistrict state subsistence fishery in 2020. Even though sockeye salmon passage past Miles Lake sonar was far below anticipated and the king salmon return was weak, the state subsistence fishery remained open continuously for the duration of the season. Restrictions in other Upper Copper River salmon fisheries were implemented and from those limitations the escapement goals for sockeye salmon and king salmon escapement were expected to be achieved and therefore no restrictions were warranted in the subsistence fishery. The state subsistence fishery harvest estimate has not yet been finalized for 2020 but it is anticipated to be near 42,000 salmon.

Batzulnetas Subsistence Salmon Fishery

There have been no state permits issued in this fishery since 2000.

Federal Subsistence Salmon Fishery

In 2019, a total of 343 federal subsistence permits were issued for the Glennallen Subdistrict (Appendix B1) and 181 federal subsistence permits were issued for the Chitina Subdistrict (Appendix B2), which was the highest number of permits issued for each fishery to date. Total federal harvest in the Glennallen Subdistrict was 17,070 salmon and 4,308 salmon in the Chitina Subdistrict (Appendices B1 and B2). Total harvests in these federal fisheries have averaged 18,926 salmon in the Glennallen Subdistrict and 1,919 salmon in the Chitina Subdistrict over the last 10 years (2009–2018).

In 2020, a total of 378 federal subsistence permits were issued for the Glennallen Subdistrict and 217 federal subsistence permits were issued for the Chitina Subdistrict (Appendices B1 and B2). These were the highest number of permits issued, exceeding the 2019 totals by 10% for the

Glennallen Subdistrict and 20% for the Chitina Subdistrict. The rise in permits in the Chitina Subdistrict may have resulted in the federal manager's decision to open this fishery 24/7 from May 15 through September 30 making a very attractive fishery for federally qualified users who could fish this area when the state had it closed to all other users. Reasons for the continued rise in federal subsistence permits for the Glennallen Subdistrict are difficult to explain with a general decrease in local population. Total federal harvests have not yet been estimated for 2020 but are anticipated to be below average.

Only a small number of permits are issued annually in the Batzulnetas Area. A single federal subsistence permit was issued by NPS in both 2019 and 2020. Salmon have been taken in this fishery in both 2019 and 2020 but due to the low number of participants, harvests are not published for confidentiality reasons.

Current Issues and Fishery Outlook

Glennallen Subdistrict Subsistence Salmon Fishery

Access to the Glennallen Subdistrict is limited for subsistence fishery permit holders. Of the approximate 155 miles of fishery, only 1–2 miles along the east shore of the Copper River immediately above the Chitina-McCarthy Bridge is unencumbered state lands accessible for most Alaska residents to fish a fish wheel or fish a dip net from shore. The remainder of the river shoreline is in private hands through individual owners or Ahtna Native Corporation. Access for fishing with a dip net from a boat is limited to undeveloped launch sites within the McCarthy Road ROW at the Chitina-McCarthy Bridge, and within the Richardson Highway ROW at the Klutina, Tazlina, and Gulkana Rivers.

The demographics of the GSD subsistence fishery are changing. Over two-thirds of the permits issued in this fishery are for harvesting fish with a dip net and most of these permits are fished from boats. From a management and sustainability aspect, this shift reduces overall harvest because the catch per dip net permit fished is far less than the catch per fish wheel permit fished. On average, the harvest for one fish wheel permit is equal to the harvest of three dip net permits. However, the increase of people in the Chitina area creates social issues of overcrowding, littering, and issues with human waste that cause conflicts among users and between users and the local residents.

Copper River sockeye and king salmon runs are expected to remain depressed into the foreseeable future and will probably demonstrate continued high interannual variations in run strength. Even with changes in how permit holders choose to harvest fish, this fishery appears to be sustainable and should continue that way. However, allocation conflicts could arise in the future due to increased frequency of restrictions in other fisheries.

Batzulnetas Subsistence Salmon Fishery

Because all the permits for this fishery are through the federal system this fishery creates no issues for state management. Harvest rates appear sustainable.

Recent Board of Fisheries Actions

Glennallen Subdistrict Subsistence Salmon Fishery

The following 11 proposals have been submitted for consideration by the BOF in 2021 and concern the GSD subsistence salmon fishery:

- Proposal 6: Require inseason reporting of subsistence, sport fish, and personal use harvest, and effort.
- Proposal 7: Prohibit guiding in subsistence finfish fisheries.
- Proposal 8: Prohibit dipnetting near tributary mouths of the Upper Copper River District.
- Proposal 9: Prohibit dipnetting from a boat in the Glennallen Subdistrict.
- Proposal 10: Prohibit dipnetting from a boat in the Upper Copper River District.
- Proposal 11: Prohibit dipnetting from a moving boat in a portion of the Chitina Subdistrict.
- Proposal 13: Prohibit dipnetting from a boat within 75 feet of an operating fish wheel in the Glennallen Subdistrict.
- Proposal 14: Prohibit the use of gillnet mesh in dip nets.
- Proposal 15: Prohibit the use of gillnet mesh in dip nets.
- Proposal 16: Prohibit the use of depth or fish finders on boats in the Upper Copper River District.
- Proposal 17: Establish specific permit and bag limits when dipnetting from a boat in the Glennallen Subdistrict.

There were five proposals submitted for consideration at the 2017 BOF meeting in Valdez that affected the Glennallen Subdistrict subsistence fishery. Proposals requiring live boxes to be installed on fish wheels or that the fish wheels be closely attended, prohibit dipnetting from a boat, or requiring an automatic delay of seven days in the opening of the fishery based on the preseason king salmon forecast all failed. Two proposals prohibiting the use of monofilament in dip nets and requiring logbooks for transporters or guides in both the CSD and GSD fisheries also failed.

A total of 10 proposals were submitted for consideration during the 2014 BOF cycle for the UCUSMA subsistence fisheries. The BOF carried a proposal specific to the Glennallen Subdistrict providing EO authority for ADF&G to establish an annual bag limit for king salmon taken by fish wheel, modify the annual limit for king salmon taken by dip net, and to modify methods and means in the subsistence fishery to reduce harvest of king salmon. Proposals to prohibit the use of monofilament webbing in dip nets, establish a check station in Chitina for harvest reporting in both the Glennallen and Chitina subdistricts, and require charter operators to maintain daily logbooks and record client harvests all failed.

Batzulnetas Subsistence Salmon Fishery

There are no proposals submitted in 2021 concerning the Batzulnetas subsistence salmon fishery.

There was one proposal submitted for consideration at the 2017 BOF meeting in Valdez that affected the Batzulnetas subsistence fishery. ADF&G proposed a change in regulations to automatically open the Batzulnetas Area Subsistence fishery each season rather than require an EO to be issued. The proposal was carried.

UPPER COPPER RIVER FRESHWATER FINFISH SUBSISTENCE FISHERIES

Background and Historical Perspective

Freshwater subsistence fishing permits have been issued in the UCUSMA since 1960 (Somerville 2017). The majority of permits issued have been for freshwater subsistence fishing with gillnets targeting whitefish between October 1 and March 31 in several area lakes. This fishery was a carryover from the territorial period, and from 1960 through 2008, the department issued freshwater subsistence permits from the Glennallen office without a formal C&T determination by the BOF. At the 2008 BOF meeting in Cordova, Ahtna Native Corporation submitted a proposal

for C&T determination for the freshwater fishes within the entire UCUSMA. The BOF made a positive C&T finding for freshwater finfish with an ANS of 25,000–42,000 usable pounds for the entire Prince William Sound Area (PWSA), which included all freshwaters of Alaska between the longitude of Cape Fairfield and the longitude of Cape Suckling south of the Yukon Area. The BOF also expanded the PWSA to include all waters of the Upper Susitna River drainage upstream of the Susitna River's confluence with the Oshetna River under subsistence regulations.

After the BOF action, the whitefish subsistence fishery participation increased from an average 15 permits for the five years prior to the BOF action to an average of 25 permits for the five following years. The fishery also attracted a less conservation-minded group of fishers. Generally, netters are allowed to retain their bycatch in a gillnet fishery because those fish will normally be dead or will die. It is encouraged that whitefish netters avoid sets that will capture lake trout and other valuable sport fishes. Throughout the history of this fishery, lake trout were a very minor component. However, starting in 2009, some subsistence whitefish gillnetters began targeting lake trout, were breaking into and trespassing at cabins around Lake Louise, and left large piles of fish carcasses on beaches. The public reaction was very strong and resulted in the department adding several stipulations to the permit prohibiting retention of any bycatch, a requirement to relocate nets capturing more than five lake trout, and requiring that all netters provide the department with 24-hour notice prior to setting their gear. At the 2011 BOF meeting in Valdez, a total of 15 proposals were submitted specific to the UCUSMA freshwater subsistence fishery. These proposals mainly addressed the whitefish fishery in Lake Louise, Susitna, and Tyone Lakes, and the harvest of lake trout. In the end, because most proposal concerns were addressed through permit stipulations, the BOF only amended and adopted a single proposal to prohibit subsistence gillnetting in the channels between Lake Louise and Susitna Lake and between Susitna Lake and Tyone Lake.

From 1960 to 2008, the maximum number of permits issued for subsistence fishing in any year was 18 in 1967 and the maximum harvest was 3,109 fish in 2007 (Somerville 2017). Over the last 10 years, freshwater subsistence fishing has occurred in Lake Louise, Susitna and Tyone Lakes in the Tyone River drainage, and Paxson and Salmonberry Lakes in the Gulkana River drainage, with most activity on Lake Louise and Paxson Lake. Participation and harvest have greatly increased over the last five years averaging 25 permits and a harvest of 2,152 fish per year from 2015 to 2018 (Table 17). In 2018 and 2019, 42 and 44 permits were issued for Lake Louise and Paxson Lake, respectively, with harvests of 7,149 fish in 2018 and 6,264 fish in 2019, primarily from Paxson Lake.

Recent Fishery Performance

Effort in the freshwater finfish subsistence fishery is at its highest on record. Over the last five years (2014–2018), an average of 25 permits have been issued annually with 56% of the permits fished each season (Table 17). Prior to 2018, the highest ever number of permits issued in this fishery was 28 during the 2009 fishery. Since 2018, more than 40 permits have been issued on an annual basis. The 2019 season was the highest amount of permits ever issued (44) and fished (33), and while the 2020 fishery is currently underway, 52 permits have been issued to date.

In 2019, a total reported harvest of 6,250 whitefish were taken with 99.6% being harvested from Paxson Lake (Table 17). The 2019 total harvest was the second highest on record and was nearly three times larger than the average five-year (2,102 whitefish) and 10-year (1,819 whitefish) harvests. In 2019, permits were issued for fishing in eight different UCUSMA lakes but of the total

33 permits that were fished that season, all but one permit fished Paxson Lake. Lake Louise was the other fishing location in 2019.

In 2019, all freshwater finfish subsistence permits issued were targeting whitefish with gillnet as the gear type. Incidental take is common with gillnet gear and retention of species other than whitefish and suckers is prohibited with this gear type. Incidental capture of other species must be recorded and, except for suckers, must be released, whether dead or alive. In 2019, there was an incidental take of seven lake trout, one burbot, and six suckers. The average annual incidental catch over the past five years has been 40 nontarget species (Table 17). Subsistence opportunity for other freshwater species such as lake trout, burbot, Arctic grayling, and Dolly Varden is allowed but only through other gear types that provide a more directed and sustainable fishery for these species.

Current Issues and Fishery Outlook

Targeting of lake trout and other highly prized sport fish with gillnet, trespass, littering, and property damage have been the biggest issues associated with the freshwater finfish subsistence fishery in the past. Current permit stipulations appear to have ended most of these issues.

Recently, subsistence gillnetters have expanded efforts away from Lake Louise and its vicinity to less populated lakes, such as Paxson and Summit Lakes. With this shift, the reporting of bycatch has declined, which has led to the suspicion of abuse. Although the nature of this fishery complicates enforcement, more effort is currently being expended to oversee this increasingly popular fishery.

The potential growth of this fishery may be concerning if it expands to many other lakes. Current annual bag limits are liberal (1,000 whitefish annually). The department has limited resources for the study and monitoring of whitefish populations in area lakes and overharvest in this fishery is a distinct possibility. The department has begun research on Paxson Lake to assess the population size and structure of whitefish and to assess the harvest to determine if current harvest levels there are sustainable. Based on that work, the department may recommend altering annual limits in the future or make other changes, if necessary, to ensure whitefish populations in area lakes can remain sustainable.

Recent Board of Fisheries Actions

Four proposals have been submitted for consideration by the BOF in 2021 that concern the Prince William Sound Area Freshwater Finfish subsistence fishery in the UCUSMA.

Proposal 22: Reverse a portion of the freshwater finfish subsistence C&T determination that overlaps the Chitina Subdistrict in the Copper River.

Proposal 23: Establish an ANS specific to rainbow trout under the Prince William Sound Area freshwater finfish C&T.

Proposals 24 and 25: Establish in regulation the current bag and annual limits for Dolly Varden and the specifications of the allowable gears in the freshwater finfish subsistence fishery.

There were no proposals submitted to the BOF in 2017 or 2014 concerning the Prince William Sound Area Freshwater Finfish subsistence fishery in the UCUSMA.

ACKNOWLEDGMENTS

The authors thank Rachael Kvapil, Region III Publications Technician II, for formatting and final report preparation, and Klaus Wuttig and Tom Taube for careful review and editing of this report. The authors also thank Jeremy Botz and Stormy Haught of the Division of Commercial Fisheries for supplying harvest data from the Copper River District drift gillnet fishery, and David Sarafin of Wrangell St. Elias National Park for providing federal subsistence harvest data.

REFERENCES CITED

- Brady, J. A., S. Morstad, and E. Simpson. 1991. Review of Prince William Sound area commercial salmon fisheries, 1990. Alaska Department of Fish and Game, Regional Information Report 2C91-02, Anchorage.
- Brase, A. L. J., and D. R. Sarafin. 2004. Recovery of Copper River Basin coded-wired tagged Chinook salmon, 2001-2002. Alaska Department of Fish and Game, Fishery Data Series No. 04-25, Anchorage.
- Bosch, D. E. 1995. Population dynamics and stock assessment of Arctic grayling (*Thymallus arcticus*) in the Gulkana River drainage, Alaska. Master's thesis, University of Alaska Fairbanks.
- Botz, J., G. Hollowell, J. Bell, R. Brenner, and S. Moffitt. 2010. 2009 Prince William Sound Area finfish management report. Alaska Department of Fish and Game, Fishery Management Report No. 10-55, Anchorage.
- Botz, J., G. Hollowell, T. Sheridan, R. Brenner, and S. Moffitt. 2012. 2010 Prince William Sound Area finfish management report. Alaska Department of Fish and Game, Fishery Management Report No. 12-06, Anchorage.
- Botz, J., T. Sheridan, A. Aiese, H. Scannell, R. Brenner, and S. Moffit. 2013. 2011 Prince William Sound Area finfish management report. Alaska Department of Fish and Game, Fishery Management Report No. 13-11, Anchorage.
- Burr, J. M. 2006. AYK lake trout management plan. Alaska Department of Fish and Game, Fishery Management Report No. 06-52, Anchorage.
- Connors, B., M. J. Malick, G. T. Ruggerone, P. Rand, M. Adkison, J. R. Irvine, R. Campbell, and K. Gorman. 2020. Climate and competition influence sockeye salmon population dynamics across the Northeast Pacific Ocean. Canadian Journal of Fisheries and Aquatic Sciences 77(6)943–949.
- Evans, D. O., J. M. Casselman, and C. C. Wilcox. 1991. Effects of exploitation, loss of nursery habitat, and stocking on the dynamics and productivity of lake trout populations in Ontario lakes: Lake trout synthesis, response to stress working group. Ontario Ministry Natural Resources, Toronto, Ontario.
- Evenson, M., and K. Wuttig. 2000. Inriver abundance, spawning distribution, and migratory timing of Copper River Chinook salmon in 1999. Alaska Department of Fish and Game, Fishery Data Series No. 00-32, Anchorage.
- Fleming, D. F. 2000. Stock assessment of rainbow trout in Summit Lake and surveys of rainbow and steelhead trout in the Gulkana River drainage, 1999. Alaska Department of Fish and Game, Fishery Data Series No. 00-33, Anchorage.
- Gryska, A. D. 2019. Stock assessment and evaluation of the Arctic grayling fishery in the mainstem Gulkana River, 2017. Alaska Department of Fish and Game, Fishery Data Series No. 19-29, Anchorage.
- Hansen, T. R. 2019. Contribution of Gulkana Hatchery sockeye salmon returns and age, sex, and length composition of the harvest of sockeye and Chinook salmon in the Upper Copper River subsistence and personal use fisheries. Alaska Department of Fish and Game, Regional Operational Plan ROP.SF.3F.2019.11, Anchorage.
- Haught, S., J. Botz, S. Moffitt, and B. Lewis. 2017. 2015 Prince William Sound area finfish management report. Alaska Department of Fish and Game, Fishery Management Report No. 17-17, Anchorage.
- Hollowell, G., B. Lewis, R. Merizon, and S. Moffitt. 2007. 2005 Prince William Sound Area finfish management report. Alaska Department of Fish and Game, Fishery Management Report No. 07-33, Anchorage.
- Jennings, G. B., K. Sundet, A. E. Bingham, and H. K. Sigurdsson 2004. Participation, catch, and harvest in Alaska sport fisheries during 2001. Alaska Department of Fish and Game, Fishery Data Series No. 04-11, Anchorage.

REFERENCES CITED (Continued)

- Jennings, G. B., K. Sundet, A. E. Bingham, and H. K. Sigurdsson 2006a. Participation, catch, and harvest in Alaska sport fisheries during 2002. Alaska Department of Fish and Game, Fishery Data Series No. 06-34, Anchorage.
- Jennings, G. B., K. Sundet, A. E. Bingham, and H. K. Sigurdsson 2006b. Participation, catch, and harvest in Alaska sport fisheries during 2003. Alaska Department of Fish and Game, Fishery Data Series No. 06-44, Anchorage.
- Jennings, G. B., K. Sundet, and A. E. Bingham. 2007. Participation, catch, and harvest in Alaska sport fisheries during 2004. Alaska Department of Fish and Game, Fishery Data Series No. 07-40, Anchorage.
- Jennings, G. B., K. Sundet, and A. E. Bingham. 2009a. Estimates of participation, catch, and harvest in Alaska sport fisheries during 2005. Alaska Department of Fish and Game, Fishery Data Series No. 09-47, Anchorage.
- Jennings, G. B., K. Sundet, and A. E. Bingham 2009b. Estimates of participation, catch, and harvest in Alaska sport fisheries during 2006. Alaska Department of Fish and Game, Fishery Data Series No. 09-54, Anchorage.
- Jennings, G. B., K. Sundet, and A. E. Bingham 2010a. Estimates of participation, catch, and harvest in Alaska sport fisheries during 2007. Alaska Department of Fish and Game, Fishery Data Series No. 10-02, Anchorage.
- Jennings, G. B., K. Sundet, and A. E. Bingham 2010b. Estimates of participation, catch, and harvest in Alaska sport fisheries during 2008. Alaska Department of Fish and Game, Fishery Data Series No. 10-22, Anchorage.
- Jennings, G. B., K. Sundet, and A. E. Bingham 2011a. Estimates of participation, catch, and harvest in Alaska sport fisheries during 2009. Alaska Department of Fish and Game, Fishery Data Series No. 11-45, Anchorage.
- Jennings, G. B., K. Sundet, and A. E. Bingham. 2011b. Estimates of participation, catch, and harvest in Alaska sport fisheries during 2010. Alaska Department of Fish and Game, Fishery Data Series No. 11-60, Anchorage.
- Jennings, G. B., K. Sundet, and A. E. Bingham. 2015. Estimates of participation, catch, and harvest in Alaska sport fisheries during 2011. Alaska Department of Fish and Game, Fishery Data Series No. 15-04, Anchorage.
- LaFlamme, T. R. 1997. Creel and escapement estimates for Chinook salmon on the Gulkana River, 1996. Alaska Department of Fish and Game, Fishery Data Series No. 97-12, Anchorage.
- Lester, N. P., B. J. Shuter, M. L. Jones, and S. Sandstrom. 2021. Chapter 12: A general, life history-based model for sustainable exploitation of Lake Charr across their range. [In] A. M. Muir, M. J. Hansen, S. C. Riley, and C. C. Krueger, editors. The Lake Charr *Salvelinus namaycush*: Biology, Ecology, Distribution, and Management. Fish & Fisheries Series 39, Springer Nature Switzerland.
- Maclean, S. H. 2013. Chinook salmon escapement in the Gulkana River, 2011-2012. Alaska Department of Fish and Game, Fishery Data Series No. 13-07, Anchorage.
- Pelekis, V., and J. J. Smith. 2013. Estimating the inriver abundance of Copper River Chinook salmon, 2012 annual report. U.S. Fish and Wildlife Service, Office of Subsistence Management, Fisheries Resource Monitoring Program, Study No. 10-503, Anchorage, Alaska.
- Perry-Plake, L. J., and A. Antonovich. 2009. Chinook salmon escapement in the Gulkana River, 2007-2008. Alaska Department of Fish and Game, Fishery Data Series No. 09-35, Anchorage.
- Perry-Plake, L. J., B. D. Taras, and M. J. Evenson. 2007. Chinook salmon escapement in the Gulkana River, 2003-2004. Alaska Department of Fish and Game, Fishery Data Series No. 07-77, Anchorage.
- Perry-Plake, L. J., and J. Huang. 2011. Chinook salmon escapement in the Gulkana River, 2009. Alaska Department of Fish and Game, Fishery Data Series No. 09-35, Anchorage.
- Piche, M. J., J. C. Whissel, and J. J. Smith. 2016. Estimating the in-river abundance of Copper River Chinook salmon, 2015 annual report. U. S. Fish & Wildlife Service, Office of Subsistence Management, Fishery Resource Monitoring Program, Study No. 14-505. Anchorage, Alaska.
- Piche, M. J., J. C. Whissel, and J. J. Smith. 2019. Estimating the in-river abundance of Copper River Chinook salmon, 2018 annual report. U. S. Fish & Wildlife Service, Office of Subsistence Management, Fishery Resource Monitoring Program, Study No. 18-504. Anchorage, Alaska.

REFERENCES CITED (Continued)

- Pirtle, R. B. 1980. Annual management report, Prince William Sound Area, Region II, 1978. Alaska Department of Fish and Game, annual management report, Anchorage.
- Potterville, W. D., and K. A. Webster. 1990. Estimates of sport effort and harvest of Chinook salmon from the Klutina and Gulkana rivers, 1989. Alaska Department of Fish and Game, Fishery Data Series No. 90-58, Anchorage.
- Roberson, K., and C. Whitmore. 1991. Copper River subsistence and personal use salmon fishery management and research, 1990. Alaska Department of Fish and game, a report to the Alaska Board of Fisheries, Prince William Sound Data Report No. 2C91-01, Anchorage.
- Randall, R., P. Fridgen, M. McCurdy, and K. Roberson. 1981. Prince William Sound Area annual finfish management report, 1980. Alaska Department of Fish and Game, Area Management Report, Anchorage.
- Roth, K., and K. Delaney. 1989. Estimates of sport effort and harvest of Chinook salmon in the Klutina River, 1988. Alaska Department of Fish and Game, Fishery Data Series No. 80, Juneau.
- Russell, C. W., J. Botz, S. Haught, and S. Moffitt. 2017. 2016 Prince William Sound area finfish management report. Alaska Department of Fish and Game, Fishery Management Report No. 17-37, Anchorage.
- Sarafin, D. 2000. Progress report of Copper River Basin Chinook salmon coded-wired tag releases, 1997-1999, and outlook for adult recovery. Alaska Department of Fish and Game, Fishery Data Series No. 00-10, Anchorage.
- Savereide, J. W. 2003. Inriver abundance, spawning distribution and migratory timing of Copper River Chinook salmon in 2002. Alaska Department of Fish and Game, Fishery Data Series No. 03-21, Anchorage.
- Savereide, J. W. 2004. Inriver abundance, spawning distribution and migratory timing of Copper River Chinook salmon in 2003. Alaska Department of Fish and Game, Fishery Data Series No. 04-26, Anchorage.
- Savereide, J. W. 2005a. Inriver abundance, spawning distribution and run timing of Copper River Chinook salmon, 2002-2004. Alaska Department of Fish and Game, Fishery Data Series No. 05-50, Anchorage.
- Savereide, J. W. 2005b. Evaluation of the effectiveness of fish wheels and dipnetting in capturing steelhead returning to the Copper River in 2004. Alaska Department of Fish and Game, Fishery Data Series No. 05-42, Anchorage.
- Savereide, J. W. 2005c. Relative abundance, migratory timing, and overwintering and spawning distribution of steelhead in the Copper River drainage. U. S. Fish & Wildlife Service, Office of Subsistence Management, Fishery Resource Monitoring Program, 2005 Annual Report (Study No. 05-502). Anchorage.
- Savereide, J. W. 2008. Relative abundance, migratory timing, and overwintering and spawning distribution of steelhead in the Copper River Drainage. Alaska Department of Fish and Game, Fishery Data Series No. 08-56, Anchorage.
- Savereide, J. W. 2010. Chinook salmon escapement in the Gulkana River, 2005-2006. Alaska Department of Fish and Game, Fishery Data Series No. 10-37, Anchorage.
- Savereide, J. W. 2011. Chinook salmon escapement in the Gulkana River, 2010. Alaska Department of Fish and Game, Fishery Data Series No. 11-71, Anchorage.
- Savereide, J. W., and M. J. Evenson. 2002. Inriver abundance, spawning distribution and migratory timing of Copper River Chinook salmon in 2001. Alaska Department of Fish and Game, Fishery Data Series No. 02-28, Anchorage.
- Schwanke, C. J. 2009. Klutina River Chinook salmon creel survey, 2006. Alaska Department of Fish and Game, Fishery Data Series, No. 09-53. Anchorage.
- Schwanke, C. J. 2015. Seasonal distribution and migration of rainbow trout in the Gulkana River, 2010–2012. Alaska Department of Fish and Game, Fishery Data Series No. 15–01. Anchorage.
- Schwanke, C. J. 2016. Chinook salmon escapement and run timing in the Gulkana River, 2013–2015. Alaska Department of Fish and Game, Fishery Data Series No. 16-46. Anchorage.
- Schwanke, C. J. 2019. Middle Fork Gulkana River Arctic grayling stock assessment. Alaska Department of Fish and Game, Regional Operational Plan ROP.SF.3F.2019.08, Anchorage.

REFERENCES CITED (Continued)

- Schwanke, C. J., and J. Bernard. 2020. Hungry Hollow Creek Arctic grayling telemetry. Alaska Department of Fish and Game, Division of Sport Fish, Regional Operational Plan ROP.SF.3F.2020.05, Anchorage.
- Schwanke, C., and B. Taras. 2009. Stock assessment of rainbow trout in the Gulkana River, 2004 and 2005. Alaska Department of Fish and Game, Fishery Data Series, No. 09-52. Anchorage.
- Schwanke, C. J., and M. Tyers. 2019. Seasonal distribution and migration of Arctic Grayling in the Gulkana River, 2016-2017. Alaska Department of Fish and Game, Fishery Data Series No. 19-13, Anchorage.
- Seeb, L. W., D. Moore, C. T. Smith, and W. D. Templin. 2006. Progress in development of a DNA baseline for genetic identification of Chinook salmon stocks of the Copper River Basin, Alaska. Alaska Department of Fish and Game. Fishery Data Series No. 06-20, Anchorage.
- Seeb, L. W., N. A. DeCovich, A. W. Barclay, C. T. Smith, and W. D. Templin. 2009. Timing and origin of Chinook salmon stocks in the Copper River and adjacent ocean fisheries using DNA markers. Alaska Department of Fish and Game. Fishery Data Series No. 09-58, Anchorage.
- Sharp, D., T. Joyce, J. Johnson, S. Moffitt, and M. Willette. 2000. Prince William Sound management area 1999 annual finfish management report. Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division. Regional Information Report No. 2A00-32, Anchorage.
- Sheridan, T., J. Botz, A. Wiese, S. Moffitt, and R. Brenner. 2013. 2012 Prince William Sound area finfish management report. Alaska Department of Fish and Game, Fishery Management Report No. 13-46, Anchorage.
- Sheridan, T., J. Botz, A. Wiese, S. Moffitt, and R. Brenner. 2014. 2013 Prince William Sound area finfish management report. Alaska Department of Fish and Game, Fishery Management Report No. 14-41, Anchorage.
- Sigurdsson, D., and B. Powers. 2009. Participation, effort, and harvest in the sport fish business/guide licensing and logbook reporting programs, 2006-2008. Alaska Department of Fish and Game, Special Publication No. 09-11, Anchorage.
- Sigurdsson, D., and B. Powers. 2010. Participation, effort, and harvest in the sport fish business/guide licensing and logbook reporting programs, 2009. Alaska Department of Fish and Game, Fishery Data Series No. 10-65, Anchorage.
- Sigurdsson, D., and B. Powers. 2011. Participation, effort, and harvest in the sport fish business/guide licensing and logbook reporting programs, 2010. Alaska Department of Fish and Game, Fishery Data Series No. 11-31, Anchorage.
- Sigurdsson, D., and B. Powers. 2012. Participation, effort, and harvest in the sport fish business/guide licensing and logbook reporting programs, 2011. Alaska Department of Fish and Game, Fishery Data Series No. 12-27, Anchorage.
- Sigurdsson, D., and B. Powers. 2013. Participation, effort, and harvest in the sport fish business/guide licensing and logbook programs, 2012. Alaska Department of Fish and Game, Fishery Data Series No. 13-37, Anchorage.
- Sigurdsson, D., and B. Powers. 2014. Participation, effort, and harvest in the sport fish business/guide licensing and logbook programs, 2013. Alaska Department of Fish and Game, Fishery Data Series No. 14-23, Anchorage. <http://www.sf.adfg.state.ak.us/FedAidPDFs/FDS14-23.pdf>
- Sigurdsson, D., and B. Powers. 2016. Participation, effort, and harvest in the sport fish business/guide licensing and logbook programs, 2014. Alaska Department of Fish and Game, Fishery Data Series No. 16-02, Anchorage. <http://www.adfg.alaska.gov/FedAidPDFs/FDS16-02.pdf>
- Smith, J. J. 2004. Feasibility of using fish wheels for long-term monitoring of Chinook salmon escapement on the Copper River. U.S. Fish and Wildlife Service, Office of Subsistence Management, Fisheries Resource Monitoring Program, 2003 Annual Report (Study No. FIS01-020). LGL Alaska Research Associates, Inc. Anchorage.
- Smith, J. J., and K. M. van den Broek. 2005a. Estimating Chinook salmon escapement on the Copper River, 2004 Annual Report. U.S. Fish and Wildlife Service, Office of Subsistence Management, Fisheries Resource Monitoring Program, Annual Report (Study No. FIS04-503). Anchorage.

REFERENCES CITED (Continued)

- Smith, J. J., and K. M. van den Broek. 2005b. Estimating king salmon escapement on the Copper River, 2005 Annual Report. U.S. Fish and Wildlife Service, Office of Subsistence Management, Fisheries Resource Monitoring Program, Annual Report (Study No. 04-503), Anchorage.
- Smith, J. J., M. R. Link, and M. B. Lambert. 2003. Feasibility of using fish wheels for long-term monitoring of king salmon escapement on the Copper River, 2002 Annual Report. U.S. Fish and Wildlife Service, Office of Subsistence Management, Fisheries Resource Monitoring Program, Annual Report (Study No. FIS01-020), Anchorage.
- Somerville, M. A. 2017. Background and regulatory history of the sport, personal use, and subsistence fisheries of the Upper Copper/Upper Susitna River Management Area, 1960–2015. Alaska Department of Fish and Game, Fishery Management Report No. 17-46, Anchorage.
- Taras, B. D., and D. R. Sarafin. 2005. Chinook salmon escapement in the Gulkana River, 2002. Alaska Department of Fish and Game, Fishery Data Series No. 05-02, Anchorage.
- Taube, T. 2002. Area management report for the recreational fisheries of the Upper Copper/Upper Susitna River management area, 2000-2001. Alaska Department of Fish and Game, Fishery Management Series No. 02-07, Anchorage.
- Templin, W. D., A. W. Barclay, J. M. Berger, L.W. Seeb, and S. D. Moffitt. 2011. Genetic stock identification of Copper River Chinook salmon harvest, 2005–2008, report to the Alaska Board of Fisheries, December 2011, Valdez, Alaska. Alaska Department of Fish and Game, Fishery Manuscript No. 11-08, Anchorage.
- van den Broek, K. M., J. J. Smith, and G. Wade. 2007. Estimating the inriver abundance of Copper River Chinook and sockeye salmon, 2006 annual report. U. S. Fish & Wildlife Service, Office of Subsistence Management, Fishery Resource Monitoring Program, Study No. 06-502. Anchorage, Alaska.
- van den Broek, K. M., J. J. Smith, and G. Wade. 2008. Estimating the inriver abundance of Copper River Chinook and sockeye salmon, 2007 annual report. U. S. Fish & Wildlife Service, Office of Subsistence Management, Fishery Resource Monitoring Program, Study No. 05-503. Anchorage, Alaska.
- van den Broek, K. M., T. M. Haluska, and J. J. Smith. 2009a. Estimating the inriver abundance of Copper River sockeye salmon, 2008 annual report. U. S. Fish & Wildlife Service, Office of Subsistence Management, Fishery Resource Monitoring Program, Study No. 08-501. Anchorage, Alaska.
- van den Broek, K. M., T. M. Haluska, and J. J. Smith. 2009b. Estimating the inriver abundance of Copper River king salmon, 2008 annual report. U. S. Fish & Wildlife Service, Office of Subsistence Management, Fishery Resource Monitoring Program, Study No. 07-503. Anchorage, Alaska.
- van den Broek, K. M., T. M. Haluska, and J. J. Smith. 2010a. Estimating the inriver abundance of Copper River sockeye salmon, 2009 annual report. U.S. Fish and Wildlife Service, Office of Subsistence Management, Fisheries Resource Monitoring Program (Study No. 08-501), Anchorage, Alaska.
- van den Broek, K. M., T. M. Haluska, and J. J. Smith. 2010b. Estimating the inriver abundance of Copper River Chinook salmon, 2009 annual report. U.S. Fish and Wildlife Service, Office of Subsistence Management, Fisheries Resource Monitoring Program (Study No. 07-503), Anchorage, Alaska.
- van den Broek, K. M., T. M. Haluska, and J. J. Smith. 2011. Estimating the inriver abundance of Copper River Chinook salmon, 2010 annual report. U.S. Fish and Wildlife Service, Office of Subsistence Management, Fisheries Resource Monitoring Program (Study No. 10-503), Anchorage, Alaska.
- van den Broek, K. M., W. S. Youmans, and J. J. Smith. 2012. Estimating the inriver abundance of Copper River Chinook salmon, 2011 annual report. U.S. Fish and Wildlife Service, Office of Subsistence Management, Fisheries Resource Monitoring Program (Study No. 10-503), Anchorage, Alaska.
- Vega, S. L., C. W. Russell, J. Botz, and S. Haught. 2019. 2017 Prince William Sound area finfish management report. Alaska Department of Fish and Game, Fishery Management Report No. 19-07, Anchorage.

REFERENCES CITED (Continued)

- Wade, G. D., J. L. Smith, K. M. van den Broek, and J. W. Savereide. 2007. Spawning distribution and run timing of Copper River sockeye salmon, 2006 annual report. U. S. Fish & Wildlife Service, Office of Subsistence Management, Fishery Resource Monitoring Program, Study No. 05-501. Anchorage, Alaska.
- Wade, G. D., J. L. Smith, K. M. van den Broek, and J. W. Savereide. 2008. Spawning distribution and run timing of Copper River sockeye salmon, 2007 final report. U. S. Fish & Wildlife Service, Office of Subsistence Management, Fishery Resource Monitoring Program, Study No. 05-501. Anchorage.
- Wade, G. D., J. L. Smith, K. M. van den Broek, T. M. Haluska, J. W. Savereide, and J. J. Smith. 2009. Spawning distribution and run timing of Copper River sockeye salmon, 2008 annual report. Prepared by Native Village of Eyak, Cordova, for the Alaska Sustainable Salmon Fund, Juneau (Project No. 45850).
- Wade, G. D., J. L. Smith, K. M. van den Broek, T. M. Haluska, J. W. Savereide, and J. J. Smith. 2010. Spawning distribution and run timing of Copper River sockeye salmon, 2009 annual report. Prepared by Native Village of Eyak, Cordova, for the Alaska Sustainable Salmon Fund, Juneau (Project No. 45850).
- Welch, D. W., A. D. Porter, and E. L. Rechisky. 2020. A synthesis of the coast-wide decline in survival of West Coast Chinook Salmon (*Oncorhynchus tshawytscha*, Salmonidae). *Fish and Fisheries* 22:194–211.
- Whissel, J. C., M. J. Piche, and J. J. Smith. 2014. Estimating the in-river abundance of Copper River Chinook salmon, 2013 annual report. U. S. Fish & Wildlife Service, Office of Subsistence Management, Fishery Resource Monitoring Program, Study No. 10-503. Anchorage, Alaska.
- Whissel, J. C., M. J. Piche, and J. J. Smith. 2015. Estimating the in-river abundance of Copper River Chinook salmon, 2014 annual report. U. S. Fish & Wildlife Service, Office of Subsistence Management, Fishery Resource Monitoring Program, Study No. 10-503. Anchorage, Alaska.
- Wiese, A., T. Sheridan, J. Botz, S. Moffitt, and R. Brenner. 2015. 2014 Prince William Sound area finfish management report. Alaska Department of Fish and Game, Fishery Management Report No. 15-34, Anchorage.
- Williams, F. T., and W. D. Potterville. 1983. Inventory and cataloging of sport fish and sport fish waters of the Copper River, Prince William Sound, and the Upper Susitna River drainages. Alaska Department of Fish and Game. Federal Aid in Fish Restoration, Annual Report of Progress, 1982-1983, Project F-9-15, 24 (G-I-F).
- Wuttig, K. G., and M. J. Evenson. 2001. Inriver abundance, spawning distribution, and migratory timing of Copper River king salmon in 2000. Alaska Department of Fish and Game, Fishery Data Series No. 01-22, Anchorage.

TABLES

Table 1.—Sport fishing effort (angler-days) in the Upper Copper/Upper Susitna Management Area (UCUSMA), Region III, and statewide, 2000–2019.

Year	Effort (angler-days)			% Effort in UCUSMA	
	UCUSMA	Region III ^a	Statewide	Region III	Statewide
2000	58,194	241,574	2,627,805	24.1	2.2
2001	48,879	194,138	2,261,941	25.2	2.2
2002	46,613	220,276	2,259,091	21.2	2.1
2003	52,051	206,705	2,219,398	25.2	2.3
2004	46,592	198,926	2,473,961	23.4	1.9
2005	41,782	196,630	2,463,929	21.2	1.7
2006	38,909	197,179	2,297,961	19.7	1.7
2007	52,837	200,245	2,543,674	26.4	2.1
2008	45,009	190,756	2,315,601	23.6	1.9
2009	53,409	202,864	2,216,445	26.3	2.4
2010	52,232	196,144	2,000,167	26.6	2.6
2011	31,993	150,787	1,919,313	21.2	1.7
2012	40,368	162,286	1,885,768	24.9	2.1
2013	39,605	175,522	2,202,957	22.6	1.8
2014	35,853	180,081	2,309,853	19.9	1.6
2015	32,481	152,427	2,212,331	21.3	1.5
2016	30,227	153,310	1,982,300	19.7	1.5
2017	30,912	139,730	2,006,244	22.1	1.5
2018	25,244	109,931	1,878,009	23.0	1.3
2019	37,048	119,873	2,075,431	30.9	1.8
Average 2014–2018	30,943	147,096	2,077,747	21.2	1.5
Average 2009–2018	37,232	162,308	2,061,339	22.8	1.8

^a Effort data after 2003 for Region III includes that from the Upper Susitna River drainage portion of Area M that is reported in Region II summaries by Jennings et al. 2004, 2006a–b, 2007, 2009a–b, 2010a–b, 2011a–b, and 2012.

Table 2.—Sport fishing effort (angler-days) in the Upper Copper/Upper Susitna Management Area (UCUSMA) by drainage, 2000–2019.

Year	Gulkana River drainage			Upper Susitna drainage			Copper River						Other Sites			Area total
	Lakes	Streams	Total	Lakes	Streams	Total	Klutina	Tazlina	Tonsina	Upstream of Gulkana	Downstream of Klutina ^a	Stocked lakes	Lakes	Streams	Total	
2000	4,825	20,896	25,721	8,899	1,747	10,646	11,125	1,583	1,182	459	780	3,689	1,717	1,292	3,009	58,194
2001	6,188	18,664	24,852	4,829	332	5,161	8,960	902	1,100	781	484	4,396	1,549	694	2,243	48,879
2002	5,910	18,060	23,970	4,991	531	5,522	9,111	751	1,381	675	301	2,377	945	1,580	2,525	46,613
2003	6,682	19,164	25,846	7,934	844	8,778	8,897	773	879	1,947	330	2,858	1,382	449	1,831	52,139
2004	3,257	17,351	20,608	6,071	819	6,890	10,472	241	1,007	1,431	2,608	1,406	1,611	318	1,929	46,592
2005	5,209	15,277	20,486	3,793	801	4,594	10,516	613	593	1,133	539	2,313	721	293	1,014	41,801
2006	2,545	11,910	14,455	4,032	1,111	5,143	12,285	587	716	734	855	2,790	738	804	1,542	39,107
2007	3,297	19,323	22,620	7,689	520	8,209	16,512	593	562	1,180	578	1,974	150	459	609	52,837
2008	4,099	16,794	20,893	7,089	1,383	8,472	12,677	641	653	1,216	1,349	1,453	807	210	1,017	48,371
2009	4,373	13,340	17,713	7,595	1,250	8,845	15,665	802	645	1,653	508	2,254	1,407	3,917	5,324	53,409
2010	2,880	13,834	16,714	9,896	1,424	11,320	16,534	1,540	725	1,726	974	2,049	400	250	650	52,232
2011	2,407	6,134	8,541	4,609	1,423	6,032	9,915	1,366	535	408	1,366	3,117	233	480	713	31,993
2012	2,524	5,593	8,117	6,625	1,163	7,788	18,030	1,067	380	894	628	2,510	721	233	954	40,368
2013	2,658	6,322	8,980	5,240	1,758	6,998	16,357	1,331	898	1,589	1,717	1,163	166	405	571	39,604
2014	2,972	5,503	8,475	5,549	639	6,188	17,276	741	436	332	652	1,331	139	283	422	35,853
2015	2,385	6,840	9,225	3,696	1,271	4,967	12,371	742	737	1,393	692	2,171	121	62	183	32,481
2016	3,048	6,129	9,177	3,120	1,264	4,384	9,974	693	437	1,548	563	3,014	241	196	437	30,227
2017	3,217	8,001	11,218	3,106	670	3,776	10,075	559	517	554	1,082	2,041	826	244	1,070	30,892
2018	1,461	6,552	8,013	4,447	1,063	5,510	4,682	1,738	351	1,512	426	1,869	685	458	1,143	25,244
2019	1,851	9,006	10,857	7,267	479	7,746	9,284	1,102	501	724	2,173	3,659	795	207	1,002	37,048
Average 2014–2018	2,617	6,605	9,222	3,984	981	4,965	10,876	895	496	1,068	683	2,085	402	249	651	30,939
Average 2009–2018	2,793	7,825	10,617	5,388	1,193	6,581	13,088	1,058	566	1,161	861	2,152	494	653	1,147	37,230

^a Copper River drainage streams and lakes below the confluence with the Klutina River and excluding the Tonsina River drainage.

Table 3.—Number of fish harvested, by species, by sport anglers fishing Upper Copper/Upper Susitna Management Area (UCUSMA) waters, 2000–2019.

Year	King salmon	Sockeye salmon	Coho salmon ^a	Rainbow trout (wild)	Rainbow trout (stocked)	Dolly Varden ^a	Lake trout	Arctic grayling ^a	Burbot	Whitefish	Landlocked salmon ^b	Other fish	Total fish
2000	5,531	12,361	760	331	2,546	991	1,709	7,082	2,290	451	436	22	34,510
2001	4,904	8,169	374	452	1,964	1,612	1,245	4,745	1,506	1,135	282	207	26,595
2002	5,098	7,761	384	393	2,901	1,388	2,215	9,849	2,224	2,288	282	54	34,837
2003	5,717	7,108	277	1,335	2,426	1,578	1,854	6,537	1,457	422	51	104	28,866
2004	3,435	6,464	131	696	1,615	2,153	2,044	4,177	1,127	885	0	1,629	24,356
2005	4,093	8,135	72	378	1,440	891	2,354	3,899	1,374	1,089	122	16	23,863
2006	3,425	14,297	54	486	1,618	777	737	3,387	575	662	42	111	26,171
2007	5,113	22,965	0	32	573	712	964	2,766	577	124	0	17	33,843
2008	3,616	11,431	56	324	694	396	1,470	4,231	1,234	655	0	18	24,125
2009	1,355	13,381	36	241	1,013	943	1,875	4,480	2,850	569	44	81	26,868
2010	2,416	14,743	90	158	1,006	682	1,631	4,723	2,997	759	78	0	29,283
2011	1,753	7,727	21	262	803	231	726	1,849	556	298	10	12	14,248
2012	535	23,404	0	512	936	753	676	4,091	995	107	11	0	32,020
2013	285	26,611	0	129	246	1,036	1,096	3,606	1,576	586	0	21	35,192
2014	931	18,005	89	240	353	148	819	2,264	458	597	0	0	23,904
2015	1,343	9,489	16	339	1,517	1,012	1,062	4,775	238	345	0	0	20,136
2016	327	7,555	0	131	1,547	1,545	1,443	2,903	555	10	83	0	16,099
2017	1,731	9,568	72	193	1,359	270	997	2,267	611	143	49	13	17,273
2018	1,280	2,943	387	218	969	1,125	732	1,945	474	223	21	0	10,317
2019	1,565	7,346	0	64	3,019	151	553	2,265	472	68	0	0	15,503
Average 2014–2018	1,122	9,512	113	224	1,149	820	1,011	2,831	467	264	31	3	17,546
Average 2009–2018	1,196	13,343	71	242	975	775	1,106	3,290	1,131	364	30	13	22,534

^a Includes fish caught in stocked waters.

^b Landlocked salmon includes stocked king and coho salmon.

Table 4.–Number of fish caught, by species, by sport anglers fishing Upper Copper/Upper Susitna Management Area (UCUSMA) waters, 2000–2019.

Year	King salmon	Sockeye salmon	Coho salmon ^a	Steelhead trout	Rainbow trout (stocked)	Rainbow trout (wild)	Dolly Varden ^a	Lake trout	Arctic Grayling ^a	Burbot	Whitefish	Landlocked salmon ^b	Other fish	Total fish
2000	18,503	19,348	1,396	334	8,038	10,292	3,332	9,388	53,421	4,316	2,019	800	58	131,245
2001	16,000	15,843	1,246	234	13,204	6,327	6,188	6,913	49,901	2,527	3,069	513	233	122,198
2002	19,497	12,181	471	129	6,870	9,735	4,714	12,197	106,424	3,878	3,756	927	100	180,879
2003	19,400	15,718	585	112	4,777	12,806	3,720	12,425	90,190	2,496	2,338	169	356	165,092
2004	12,664	10,912	478	64	6,624	6,212	5,622	8,212	51,219	1,626	1,420	0	1,637	106,690
2005	9,704	16,093	172	64	4,096	6,858	2,551	11,057	50,760	2,150	2,259	279	32	106,075
2006	10,971	21,778	72	50	4,125	3,790	2,189	4,043	25,524	1,054	1,023	42	111	74,772
2007	12,109	30,875	11	99	1,666	4,253	3,647	6,125	29,815	1,503	273	0	26	90,402
2008	7,827	16,912	57	61	2,819	7,414	1,814	9,140	47,718	1,482	1,605	0	36	96,885
2009	4,231	19,788	36	20	2,563	4,607	3,211	12,843	76,559	3,471	1,076	554	81	129,040
2010	8,213	19,489	114	84	5,044	4,926	1,089	14,082	54,882	5,897	1,994	282	10	116,106
2011	7,025	11,873	21	0	4,498	3,794	1,058	3,846	19,738	1,157	483	10	23	53,526
2012	1,869	30,336	0	0	5,155	4,141	1,712	4,217	30,320	1,853	373	66	0	80,042
2013	1,195	36,246	229	58	1,149	4,826	2,304	8,218	29,991	2,162	691	0	42	87,111
2014	2,248	24,943	129	0	1,931	3,405	493	4,491	26,163	821	2,400	0	0	67,024
2015	4,165	13,654	16	0	2,846	2,313	3,163	7,680	28,702	493	721	0	0	63,753
2016	1,508	8,718	0	0	5,416	5,521	2,510	6,319	44,661	758	217	83	0	75,711
2017	7,508	12,465	150	19	7,504	4,680	2,522	6,152	34,060	734	335	115	13	76,257
2018	5,087	4,112	387	62	3,689	3,064	3,023	5,383	24,217	853	477	41	0	50,395
2019	4,454	8,630	42	0	9,998	2,115	877	7,153	38,843	2,680	355	0	0	75,147
Average 2014–2018	4,103	12,778	136	16	4,277	3,797	2,342	6,005	31,561	732	830	48	3	66,628
Average 2009–2018	4,305	18,162	108	24	3,980	4,128	2,109	7,323	36,929	1,820	877	115	17	79,897

^a Includes fish caught in stocked waters.

^b Landlocked salmon includes stocked king and coho salmon.

Table 5.—Inseason regulatory action history for the Copper River District commercial and Upper Copper River king salmon fisheries, 2009–2020.

Year	Escapement ^{a,b}	Date	Copper River District ^c	Chitina Subdistrict	Upper Copper River sport fishery
2009	27,787	21-May	Inside area closed 6 out of 13 periods		
		8-Jun		Prohibited retention	
		16-Jun			Reduced annual limit from 4 to 2, with only 1 of the 2 allowed from any tributary or the Copper River mainstem.
		29-Jun			Closed the Gulkana River drainage.
		27-Jul			Prohibited retention in the Klutina River and the use of bait and treble hooks.
2010	16,764	20-May	Inside area closed 5 out of 13 periods		
		21-Jun		Prohibited retention	Reduced annual limit from 4 to 2, with only 1 of the 2 allowed from any tributary or the Copper River mainstem.
2011	27,994	16-May	Inside area closed 5 out of 14 periods		
		25-Jun			Reduced annual limit from 4 to 2, with only 1 of the 2 allowed from any tributary or the Copper River mainstem and prohibited retention in the Copper River drainage upstream of the Klutina River (including the Gulkana River).
		27-Jun		Prohibited retention	
2012	27,835	17-May	Inside area closed 10 out of 13 periods		
		18-Jun		Prohibited retention	
		30-Jun			Reduced annual limit from 4 to 1 and prohibited retention and the use of bait and treble hooks in the Gulkana River .
		28-Jul			Prohibited retention and the use of bait and treble hooks in the Klutina River and the Upper Copper River drainage downstream of the Klutina River.
2013	29,008	16-May	Inside area closed 4 out of 9 periods		
		15-Jun			Reduced annual limit from 4 to 1 and prohibited retention and the use of bait and treble hooks in the Gulkana River.
		24-Jun		Prohibited retention	
2014	20,709	15-May	Inside area closed 11 out of 13 periods		
		14-Jun			Reduced annual limit from 4 to 1.
		16-Jun		Prohibited retention	

-continued-

Table 5.–Page 2 of 2.

Year	Escapement ^{a,b}	Date	Copper River District ^c	Chitina Subdistrict	Upper Copper River sport fishery
2015	26,764	15-May	Expanded inside area and closed 10 out of 15 periods	No action	No management actions taken.
2016	12,826	15-May	Expanded Inside area and closed 12 out of 14 periods		
		18-Jun			Prohibited retention and the use of bait and treble hooks in the Copper River drainage upstream of the Klutina River (including the Gulkana River).
		20-Jun		Prohibited retention	
		25-Jun			Closed the Upper Copper River drainage to sport fishing for king salmon.
2017	33,655	15-May	Expanded Inside area and closed 9 out of 13 periods		
		1-Jan			Closed the Upper Copper River drainage to sport fishing for king salmon River.
		1-Jun		Prohibited retention	
		5-Jun			Re-opened Upper Copper River drainage to sport fishing for king salmon with 2-fish annual bag limit
		19-Jun		Re-open retention	
2018	42,202	15-May	Inside area closed for 3 out of 3 periods	No action	No action
2019	45,149	15-May	Inside area closed for 7 out of 13 periods	No action	No action
2020	22,000	15-May	Expanded Inside area and closed for 4 out of 5 periods		
		20-Jun			Upper Copper River drainage annual limit reduced from 4 to 1 fish.
		22-Jun		Prohibited retention	

Note: In 2017, a preseason emergency order reduced king salmon annual limits in the Glennallen Subdistrict subsistence fishery to 2 fish for both dip net and fish wheel gear. This emergency order was rescinded on June 3. No other inseason action has been taken in the Glennallen Subdistrict subsistence fishery for the conservation of king salmon.

^a Numbers in bold are below the escapement goal.

^b 2020 escapement data are preliminary.

^c Reflects number of periods excluding the portion of the Copper River District in and around the barrier islands through the end of the king salmon run (approximately June 30).

Table 6.—Harvest of king salmon by sport anglers fishing in the Upper Copper/Upper Susitna Management Area (UCUSMA) by drainage, 2000–2019.

Year	Gulkana River				Klutina River drainage	Tonsina River drainage	Tazlina River drainage	Copper River		Other waters	Area total
	Upper river	Lower river	Unspecified	Total				Upstream of Gulkana	Downstream of Klutina		
2000	1,787	2,304	86	4,177	1,303	0	0	0	10	41	5,531
2001	1,338	1,793	143	3,274	1,465	11	0	0	32	122	4,904
2002	715	2,125	143	2,983	1,778	230	0	13	0	94	5,098
2003	1,427	2,164	116	3,707	1,873	25	0	0	12	100	5,717
2004	64	1,670	156	1,890	1,338	115	0	0	39	53	3,435
2005	392	2,081	100	2,573	1,276	214	0	0	15	15	4,093
2006	464	1,495	188	2,147	1,136	100	0	0	13	29	3,425
2007	467	2,639	163	3,269	1,683	0	0	0	113	48	5,113
2008	241	2,036	46	2,323	1,160	0	0	0	118	15	3,616
2009	62	454	0	516	733	58	0	0	48	0	1,355
2010	401	1,038	13	1,452	863	0	0	0	101	0	2,416
2011	0	536	27	563	1,043	0	0	0	107	40	1,753
2012	14	106	76	196	314	0	0	0	25	0	535
2013	0	0	0	0	223	51	0	0	0	11	285
2014	16	431	0	447	414	16	0	0	54	0	931
2015	116	658	0	774	481	50	0	20	18	0	1,343
2016	0	225	68	293	0	0	0	0	34	0	327
2017	34	502	94	630	832	111	0	0	137	21	1,731
2018	0	558	20	578	616	86	0	0	0	0	1,280
2019	123	671	54	848	589	128	0	0	0	0	1,565
Average 2014–2018	33	475	36	544	469	53	0	4	49	4	1,122
Average 2009–2018	64	451	30	545	552	37	0	2	52	7	1,196

Note: Harvest data are from the Alaska Sport Fishing Survey (<http://www.adfg.alaska.gov/sf/sfpublic/sportfishingsurvey/>). Although data are presented for all waters, data in bold result from fewer than 12 respondents and are subject to high variance. Bold data show relative distribution of annual effort and, as presented, only indicate that sport fishing occurred in these waters, or, in cases where harvest or catch is reported, that some level of harvest occurred.

Table 7.—Summary of king salmon harvests and upriver escapement in the Copper River, 2000–2019.

Year	Commercial harvest ^a	Copper River Districtsubsistence harvest	Sport harvest ^b	Glennallen Subdistrict harvest ^c	Chitina Subdistrict harvest ^c	Total harvest	Upriver return estimate	Estimated total return	Upriver escapement	Estimate source
2000	32,018	689	5,531	4,856	3,168	46,262	38,047	70,754	24,492	ADF&G
2001	40,551	826	4,904	3,553	3,113	52,947	39,778	81,155	28,208	ADF&G
2002	39,552	549	5,098	4,217	2,056	51,472	32,873	72,974	21,502	ADF&G
2003	49,031	710	5,717	3,092	1,921	60,471	44,764	94,505	34,034	NVE
2004	38,889	1,106	3,435	3,982	2,502	49,914	40,564	80,559	30,645	NVE
2005	35,764	260	4,093	2,618	2,094	44,829	30,333	66,357	21,528	NVE
2006	31,309	779	3,425	3,229	2,681	41,423	67,789	99,877	58,454	NVE
2007	40,274	1,145	5,113	3,939	2,722	53,193	46,349	87,768	34,575	NVE
2008	12,067	470	3,616	3,218	2,022	21,393	41,343	53,880	32,487	NVE
2009	10,398	212	1,355	3,036	223	15,224	32,400	43,010	27,786	NVE
2010	10,582	276	2,416	2,425	718	16,417	22,323	33,181	16,764	NVE
2011	19,788	212	1,753	3,062	1,080	25,895	33,889	53,889	27,994	NVE
2012	12,623	237	535	2,510	572	16,477	31,452	44,312	27,835	NVE
2013	9,445	854	285	2,522	762	13,868	32,581	42,880	29,012	NVE
2014	11,011	153	931	1,785	733	14,613	24,158	35,322	20,709	NVE
2015	23,701	167	1,343	2,614	1,585	29,410	32,306	56,174	26,764	NVE
2016	13,161	73	327	2,471	726	16,758	16,009	29,243	12,485	NVE
2017	14,628	778	1,731	3,366	1,973	22,476	40,725	56,131	33,655	NVE
2018	7,303	1,356	1,280	7,668	1,374	18,981	52,524	61,183	42,202	NVE
2019	18,605	808	1,565	4,315	2,689	27,982	43,714	63,127	35,145	NVE
Average 2014–2018	13,961	505	1,122	3,581	1,278	20,448	33,144	47,611	27,163	
Average 2009–2018	13,264	432	1,196	3,146	975	19,012	31,837	45,533	26,521	

Note: ND = No data; ADF&G = Alaska Department of Fish and Game; NVE = Native Village of Eyak.

^a Includes commercial personal use, educational, and donated harvests from the Copper River District.

^b Includes sport harvest from Copper River District and delta and Upper Copper River.

^c These data are expanded to reflect unreported permits and include reported federal subsistence harvest from 2002 to 2004 and expanded federal subsistence harvest beginning with 2005. See Tables 20 and 21 for reported state fishery harvests.

Table 8.—Catch of king salmon by sport anglers fishing in the Upper Copper/Upper Susitna Management Area (UCUSMA) by drainage, 2000–2019.

Year	Gulkana River				Klutina River drainage	Tonsina River drainage	Tazlina River drainage	Copper River		Other waters	Area total
	Upper river	Lower river	Unspecified	Total				Upstream of Gulkana	Downstream of Klutina		
2000	6,128	7,650	141	13,919	4,057	292	0	178	16	41	18,503
2001	4,128	6,417	289	10,834	4,922	21	0	53	158	12	16,000
2002	3,384	8,575	357	12,316	5,645	861	0	13	471	191	19,497
2003	4,161	8,876	293	13,330	5,418	290	0	202	25	135	19,400
2004	1,380	5,433	555	7,368	4,135	521	0	404	173	63	12,664
2005	1,596	4,697	217	6,510	2,651	483	0	0	45	15	9,704
2006	1,719	5,664	204	7,587	2,890	367	0	0	13	114	10,971
2007	1,203	7,254	163	8,620	3,025	31	62	16	275	80	12,109
2008	549	5,389	46	5,984	1,670	15	11	0	132	15	7,827
2009	616	1,469	0	2,085	1,888	79	0	15	164	0	4,231
2010	982	3,719	39	4,740	3,240	39	13	0	181	0	8,213
2011	64	2,372	161	2,597	3,476	72	17	0	802	61	7,025
2012	177	495	13	685	1,118	41	0	0	25	0	1,869
2013	0	327	0	327	560	285	0	0	0	23	1,195
2014	34	1,000	0	1,034	955	130	0	0	129	0	2,248
2015	516	2,533	0	3,049	835	210	33	20	18	0	4,165
2016	54	474	509	1,037	361	40	36	0	34	0	1,508
2017	47	1,731	443	2,221	3,458	1,367	0	0	441	21	7,508
2018	197	2,387	218	2,802	2,018	85	0	0	182	0	5,087
2019	1,000	2,224	73	3,297	940	217	0	0	0	0	4,454
Average 2014–2018	170	1,625	234	2,029	1,525	366	14	4	161	4	4,103
Average 2009–2018	269	1,651	138	2,058	1,791	235	10	4	198	11	4,305

Note: Harvest data are from the Alaska Sport Fishing Survey (<http://www.adfg.alaska.gov/sf/sfpublic/sportfishingsurvey/>). Although data are presented for all waters, data in bold result from fewer than 12 respondents and are subject to high variance. Bold data show relative distribution of annual effort and, as presented, only indicate that sport fishing occurred in these waters, or, in cases where harvest or catch is reported, that some level of harvest occurred.

Table 9.—Summary of sockeye harvests and upriver escapement in the Copper River 2000–2019.

Year	Commercial harvest ^a	CRD subsistence harvest ^b	Sport harvest ^c	Glennallen Subdistrict harvest ^d	Chitina Subdistrict harvest ^d	Total harvest	Upriver return estimate ^e	Estimated total return	Spawning escapement ^f
2000	881,419	4,360	14,550	59,497	107,856	1,067,682	598,790	1,633,508	343,691
2001	1,325,690	3,072	8,509	83,787	132,108	1,553,166	838,427	2,237,918	538,681
2002	1,249,920	3,067	8,492	58,800	86,543	1,406,822	797,390	2,192,176	581,717
2003	1,192,164	1,607	7,549	60,623	81,513	1,343,456	702,327	2,042,839	507,895
2004	1,048,603	1,822	7,383	73,214	108,527	1,239,549	628,950	1,819,064	433,945
2005	1,333,574	939	8,803	86,140	122,463	1,551,919	824,792	2,276,785	515,599
2006	1,498,423	4,505	14,455	76,056	124,810	1,718,249	891,917	2,592,795	579,552
2007	1,904,038	6,184	24,713	83,338	126,154	2,144,427	873,252	2,961,792	612,147
2008	323,096	4,001	12,682	57,632	82,318	479,729	677,001	1,141,249	480,597
2009	902,941	1,810	14,374	60,517	90,917	1,070,559	677,348	1,721,676	469,124
2010	643,086	2,016	16,085	84,856	140,811	886,854	901,488	1,715,742	502,992
2011	2,061,525	1,818	8,565	75,375	129,985	2,277,268	880,342	3,097,537	607,657
2012	1,874,726	4,334	24,168	92,792	128,058	2,124,078	1,262,948	3,276,472	953,245
2013	1,617,717	5,741	26,997	90,788	182,915	1,924,158	1,234,479	3,009,733	860,929
2014	2,062,265	1,751	18,179	98,535	158,879	2,339,609	1,194,260	3,386,860	864,988
2015	1,761,443	1,555	9,619	108,696	225,425	2,106,738	1,313,794	3,209,312	930,061
2016	1,184,901	1,185	7,801	81,839	150,303	1,426,029	785,584	2,075,016	513,546
2017	731,932	2,602	9,768	56,110	134,294	934,706	682,701	1,531,335	465,539
2018	45,917	5,189	2,965	56,093	80,542	190,706	649,053	817,121	478,701
2019	1,265,956	6,233	7,346	76,387	175,413	1,531,335	995,940	2,391,059	721,033
Average 2014–2018	1,157,292	2,456	9,666	80,255	149,889	1,399,558	925,078	2,203,929	650,567
Average 2009–2018	1,288,645	2,800	13,852	80,560	142,213	1,528,071	958,200	2,384,080	664,678

^a Includes commercial harvest plus homepack, donated and educational harvests.

^b Includes state and federal subsistence harvests in the Copper River District (CRD).

^c Includes sport harvest in the Copper River Delta and the Upper Copper River upstream of Haley Creek

^d These data are expanded to reflect unreported state harvest and include reported federal harvest (2002–2004) and expanded federal harvest beginning in 2005.

^e This includes the Miles Lake sonar count minus the king salmon mark-recapture point estimate

^f Upriver return escapement minus upriver sockeye harvests.

Table 10.–Harvest of sockeye salmon by sport anglers fishing Upper Copper/Upper Susitna Management Area (UCUSMA) drainages, 2000–2019.

Year	Gulkana River				Klutina River drainage	Tonsina River drainage	Tazlina River drainage	Copper River		Other waters	Area total
	Upper river	Lower river	Unspecified	Total				Upstream of Gulkana	Downstream of Klutina		
2000	2,902	1,194	116	4,212	7,219	0	35	141	317	342	12,361
2001	920	852	12	1,784	5,834	0	0	0	193	334	8,169
2002	809	1,680	32	2,521	4,704	96	0	0	13	403	7,761
2003	550	843	72	1,465	5,321	21	0	11	203	87	7,108
2004	33	776	23	832	5,069	142	0	11	0	266	6,464
2005	57	939	73	1,069	6,646	0	0	0	180	140	8,135
2006	230	693	0	923	13,222	0	0	0	130	22	14,297
2007	70	1,300	38	1,408	21,242	25	0	0	290	0	22,965
2008	369	206	0	575	10,107	0	0	0	749	0	11,431
2009	328	886	87	1,301	11,759	0	51	0	270	0	13,381
2010	160	1,316	0	1,476	12,238	156	0	0	708	165	14,743
2011	0	684	101	785	6,025	0	46	0	871	0	7,727
2012	11	1,528	0	1,539	21,564	0	0	0	301	0	23,404
2013	25	1,953	0	1,978	23,721	0	97	0	687	128	26,611
2014	0	586	123	709	17,004	0	0	0	292	0	18,005
2015	31	502	0	533	8,903	0	0	0	53	0	9,489
2016	21	770	64	855	6,421	52	0	15	105	107	7,555
2017	0	1,309	0	1,309	7,695	42	0	21	481	20	9,568
2018	0	676	0	676	1,597	0	0	0	488	182	2,943
2019	0	1,006	0	1,006	6,118	0	18	0	0	204	7,346
Average 2014–2018	10	769	37	816	8,324	19	0	7	284	62	9,512
Average 2009–2018	58	1,021	38	1,116	11,693	25	19	4	426	60	13,343

Note: Harvest data are from the Alaska Sport Fishing Survey (<http://www.adfg.alaska.gov/sf/sfpublic/sportfishingsurvey/>). Although data are presented for all waters, data in bold result from fewer than 12 respondents and are subject to high variance. Bold data show relative distribution of annual effort and, as presented, only indicate that sport fishing occurred in these waters, or, in cases where harvest or catch is reported, that some level of harvest occurred.

Table 11.–Harvest of wild Arctic grayling by sport anglers in the Upper Copper/Upper Susitna Management Area (UCUSMA) by drainage, 2000–2019.

Year	Gulkana River drainage	Upper Susitna River drainage	Klutina River drainage	Tonsina River drainage	Tazlina River drainage		Copper River drainage		Other lakes and streams	Area total
					Mendeltna Creek	Other lakes and streams	Above Gulkana	Below Klutina		
2000	2,062	2,181	134	123	245	274	588	0	954	6,561
2001	1,753	686	267	128	70	120	589	29	630	4,272
2002	2,646	928	566	180	23	370	2,598	62	537	7,910
2003	2,132	1,047	575	58	23	312	1,466	0	236	5,849
2004	1,331	819	197	112	65	73	805	124	589	4,115
2005	1,553	380	59	86	0	500	432	96	540	3,646
2006	1,179	998	77	8	46	359	194	137	298	3,296
2007	729	387	138	0	97	130	840	144	19	2,484
2008	1,665	1,431	17	59	190	34	616	42	76	4,130
2009	1,522	1,216	47	35	0	85	462	0	1,078	4,445
2010	2,081	1,850	57	12	107	90	210	89	227	4,723
2011	532	1,195	0	9	0	0	14	28	29	1,807
2012	1,393	1,335	42	0	0	710	243	67	144	3,934
2013	436	1,340	0	0	23	401	1,087	72	0	3,359
2014	501	700	49	0	81	243	220	0	77	1,871
2015	1,299	1,530	92	33	82	963	655	82	0	4,736
2016	1,025	1,201	73	64	31	0	509	0	0	2,903
2017	1,485	442	12	0	0	29	227	0	0	2,195
2018	850	586	0	0	0	0	288	0	208	1,932
2019	1,280	431	0	0	194	0	39	0	146	2,090
Average 2014–2018	1,032	892	45	19	39	247	380	16	57	2,727
Average 2009–2018	1,112	1,140	37	15	32	252	392	34	176	3,191

Note: Harvest data are from the Alaska Sport Fishing Survey (<http://www.adfg.alaska.gov/sf/sfpublic/sportfishingsurvey/>). Although data are presented for all waters, data in bold result from fewer than 12 respondents and are subject to high variance. Bold data show relative distribution of annual effort and, as presented, only indicate that sport fishing occurred in these waters, or, in cases where harvest or catch is reported, that some level of harvest occurred.

Table 12.–Catch of wild Arctic grayling by sport anglers in the Upper Copper/Upper Susitna Management Area (UCUSMA) by drainage, 2000–2019.

Year	Gulkana River drainage	Upper Susitna River drainage	Klutina River drainage	Tonsina River drainage	Tazlina River drainage		Copper River adrainage		Other lakes and streams	Area total
					Mendeltna Creek	Other lakes and streams	Above Gulkana	Below Klutina		
2000	28,819	8,632	436	407	857	1,402	3,522	769	5,056	49,900
2001	31,496	4,155	925	231	661	697	1,802	38	4,164	44,169
2002	65,826	12,038	2,119	463	334	1,715	9,300	346	7,101	99,242
2003	66,014	5,895	1,706	210	396	1,533	8,657	81	2,264	86,756
2004	34,543	4,828	1,407	301	269	171	3,904	238	5,011	50,672
2005	40,344	2,718	805	343	129	1,321	2,623	96	2,209	50,588
2006	15,638	5,628	232	25	250	716	1,578	143	850	25,060
2007	20,103	1,828	1,486	274	711	438	3,342	246	269	28,697
2008	35,613	6,055	276	278	1,036	474	1,788	1,095	553	47,168
2009	41,749	6,046	795	435	1,078	590	3,478	187	21,311	75,669
2010	38,766	10,074	248	141	776	1,247	1,353	181	1,680	54,466
2011	13,363	3,296	449	136	1,150	71	141	28	110	18,744
2012	17,358	6,679	798	0	141	1,569	1,245	398	912	29,100
2013	17,129	8,198	840	155	69	1,176	534	234	620	28,955
2014	13,163	7,107	129	342	471	849	1,179	0	1,328	24,568
2015	12,731	9,317	513	552	287	1,686	3,140	232	0	28,458
2016	35,188	5,614	199	429	234	593	1,788	199	345	44,589
2017	24,222	4,523	376	124	0	2,298	227	881	1,237	33,888
2018	14,442	6,924	781	0	0	776	361	0	309	23,593
2019	24,534	7,009	24	40	387	912	1,247	122	326	34,601
Average 2014–2018	19,949	6,697	400	289	198	1,240	1,339	262	644	31,019
Average 2009–2018	22,811	6,778	513	231	421	1,086	1,345	234	2,785	36,203

Note: Harvest data are from the Alaska Sport Fishing Survey (<http://www.adfg.alaska.gov/sf/sfpublic/sportfishingsurvey/>). Although data are presented for all waters, data in bold result from fewer than 12 respondents and are subject to high variance. Bold data show relative distribution of annual effort and, as presented, only indicate that sport fishing occurred in these waters, or, in cases where harvest or catch is reported, that some level of harvest occurred.

Table 13.—Harvest of lake trout by sport anglers in the Upper Copper/Upper Susitna Management Area (UCUSMA) by drainage, 2000–2019.

Year	Gulkana River drainage					Upper Susitna River drainage				Klutina River drainage	Tazlina River drainage	Other lakes and streams	Area total
	Paxson Lake	Summit Lake	Crosswind Lake	Other lakes and streams	Gulkana total	Lake Louise	Susitna Lake	Other lakes and streams	Upper Susitna total				
2000	228	79	297	27	631	563	131	93	787	18	83	190	1,709
2001	302	74	44	86	506	259	110	118	487	17	0	235	1,245
2002	328	66	299	60	753	458	152	138	748	0	122	592	2,215
2003	399	102	403	104	1,008	393	128	80	601	52	0	193	1,854
2004	46	107	105	30	288	770	30	347	1,147	14	0	595	2,044
2005	50	32	519	71	672	370	429	478	1,277	66	16	323	2,354
2006	61	10	191	32	294	200	148	42	390	0	0	53	737
2007	77	56	97	54	284	340	61	0	401	0	0	279	964
2008	173	67	90	0	330	604	206	85	895	0	0	245	1,470
2009	191	125	295	18	629	493	217	230	940	25	58	223	1,875
2010	268	192	164	0	624	697	73	101	871	0	54	82	1,631
2011	42	37	50	36	165	239	122	62	423	0	75	63	726
2012	149	0	32	0	181	169	66	94	329	16	0	150	676
2013	132	0	300	113	545	239	108	35	382	0	21	148	1,096
2014	155	109	16	11	291	278	120	86	484	0	0	44	819
2015	213	59	56	0	328	297	194	111	602	16	0	116	1,062
2016	200	37	47	203	487	201	0	380	581	21	0	354	1,443
2017	175	66	211	37	489	273	0	59	332	26	0	150	997
2018	49	0	27	0	76	396	56	104	556	0	0	100	732
2019	98	104	29	0	231	191	49	0	240	0	0	82	553
Average 2014–2018	158	54	71	50	334	289	74	148	511	13	0	153	1,011
Average 2009–2018	157	63	120	42	382	328	96	126	550	10	21	143	1,106

Note: Harvest data are from the Alaska Sport Fishing Survey (<http://www.adfg.alaska.gov/sf/sfpublic/sportfishingsurvey/>). Although data are presented for all waters, data in bold result from fewer than 12 respondents and are subject to high variance. Bold data show relative distribution of annual effort and, as presented, only indicate that sport fishing occurred in these waters, or, in cases where harvest or catch is reported, that some level of harvest occurred.

Table 14.—Catch of wild rainbow trout by sport anglers fishing Upper Copper/Upper Susitna Management Area (UCUSMA) waters by drainage, 2000–2019.

Year	Gulkana River drainage ^a				Klutina River drainage	Tazlina River drainage	Tonsina River drainage	Copper River drainage		Other lakes and streams	Area total
	Upper River	Lower River	Gulkana R. other	Total				Upstream of Gulkana	Downstream of Klutina		
2000	5,354	1,281	194	6,829	267	0	78	0	1,496	1,622	10,292
2001	2,806	961	381	4,148	256	0	36	0	767	1,120	6,327
2002	5,166	2,525	31	7,722	7	0	105	14	349	1,538	9,735
2003	5,496	676	332	6,504	66	48	0	0	0	6,188	12,806
2004	3,995	787	0	4,782	27	26	81	0	535	761	6,212
2005	2,967	1,251	405	4,623	87	21	331	0	374	1,422	6,858
2006	1,361	405	205	1,971	58	741	67	0	488	465	3,790
2007	3,173	652	210	4,035	21	0	0	0	73	124	4,253
2008	4,183	593	624	5,400	38	0	61	0	1,707	208	7,414
2009	3,700	328	0	4,028	172	101	10	0	0	296	4,607
2010	3,044	999	28	4,071	117	113	15	0	422	188	4,926
2011	1,684	622	615	2,921	132	81	33	0	384	243	3,794
2012	1,815	778	44	2,637	518	17	10	0	530	429	4,141
2013	2,835	185	819	3,839	0	687	0	13	287	0	4,826
2014	1,587	110	0	1,697	410	0	0	196	308	794	3,405
2015	1,260	308	0	1,568	33	73	0	0	339	300	2,313
2016	3,250	643	236	4,129	255	86	0	0	1,004	47	5,521
2017	2,557	454	110	3,121	23	360	0	18	875	283	4,680
2018	1,932	36	0	1,968	126	77	0	0	11	882	3,064
2019	864	34	0	898	0	319	0	0	354	544	2,115
Average 2014–2018	2,117	310	69	2,497	169	119	0	43	507	461	3,797
Average 2009–2018	2,366	446	185	2,998	179	160	7	23	416	346	4,128

Note: Harvest data are from the Alaska Sport Fishing Survey (<http://www.adfg.alaska.gov/sf/sfpublic/sportfishingsurvey/>). Although data are presented for all waters, data in bold result from fewer than 12 respondents and are subject to high variance. Bold data show relative distribution of annual effort and, as presented, only indicate that sport fishing occurred in these waters, or, in cases where harvest or catch is reported, that some level of harvest occurred.

^a The Gulkana River has been closed to the retention of rainbow trout since 1991.

Table 15.—Number of permits issued and expanded salmon harvests for the Chitina Subdistrict personal use salmon fishery in the Copper River, 2000–2019.

Year	Permits		Estimated salmon harvest			
	Issued	Fished	King	Sockeye	Coho	Total ^a
2000 ^b	8,146	7,216	3,168	107,856	3,657	114,884
2001 ^b	9,458	6,644	3,113	132,108	2,720	138,425
2002 ^b	6,804	4,480	2,023	85,968	1,934	90,242
2003	6,441	4,257	1,903	80,796	2,533	85,496
2004	8,156	4,955	2,495	107,312	2,860	113,176
2005	8,230	5,330	2,043	120,013	1,869	124,403
2006	8,497	5,291	2,663	123,261	2,715	129,103
2007	8,377	5,549	2,694	125,126	1,742	130,222
2008	8,041	4,803	1,999	81,359	2,711	86,476
2009	7,958	4,830	214	90,035	1,712	92,228
2010	9,970	6,075	700	138,487	2,013	141,565
2011	9,217	5,710	1,067	128,052	1,702	131,265
2012	10,016	5,781	567	127,143	1,385	129,362
2013	10,592	6,768	744	180,663	797	182,904
2014	11,717	7,116	719	157,215	1,129	159,392
2015	12,635	7,829	1,570	223,080	841	226,832
2016	11,394	6,219	711	148,982	1,182	151,480
2017	9,490	6,161	1,961	132,694	715	136,043
2018	4,982	3,044	1,273	77,051	1,436	80,135
2019	8,071	5,467	2,611	171,203	1,064	175,487
Average 2014–2018	10,044	6,074	1,247	147,804	1,061	150,776
Average 2009–2018	9,797	5,953	953	140,340	1,291	143,121

^a Total includes steelhead trout and unidentified salmon.

^b From 2000 to 2002 the Chitina Subdistrict was classified a subsistence fishery.

Table 16.—Number of permits issued and expanded salmon harvests for the Glennallen Subdistrict subsistence salmon fishery in the Copper River, 2000–2019.

Year	Permits		Estimated salmon harvest			
	Issued	Fished	King	Sockeye	Coho	Total ^a
2000	1,251	1,134	4,856	59,497	532	64,885
2001	1,239	1,148	3,553	83,787	1,154	88,578
2002	1,121	819	3,653	50,850	530	55,058
2003	1,012	780	2,538	47,007	467	50,055
2004	956	732	3,346	55,510	577	59,497
2005	961	730	2,229	64,213	154	66,615
2006	984	754	2,769	57,710	212	60,774
2007	1,174	880	3,276	65,714	238	69,284
2008	1,186	858	2,381	43,157	493	46,106
2009	1,090	780	2,493	46,849	228	49,643
2010	1,321	953	2,099	70,719	293	73,260
2011	1,306	965	2,319	59,622	372	62,477
2012	1,527	1,047	2,095	76,305	335	78,851
2013	1,339	974	2,148	73,728	143	76,044
2014	1,656	1,099	1,365	75,501	233	77,131
2015	1,631	1,143	2,212	81,800	77	84,105
2016	1,769	1,137	2,075	62,474	45	64,617
2017	1,632	1,044	2,935	39,859	57	42,862
2018	1,659	1,018	4,531	39,359	151	44,073
2019	1,713	1,158	3,429	60,257	204	63,920
Average 2014–2018	1,669	1,088	2,624	59,799	113	62,558
Average 2009–2018	1,493	1,016	2,427	62,622	193	65,306

^a Total includes steelhead trout and unidentified salmon.

Table 17.—Number of freshwater finfish subsistence permits issued and harvest from Upper Copper/Upper Susitna Management Area (UCUSMA) waters, 2000–2019.

Year	Permits				Harvest ^{a,b}				
	Total Issued	Total fished	Water bodies permitted	Water bodies fished	Whitefish	Lake Trout	Burbot	Other	Total
2000	9	3	6	6	1,974	4	0	3	1,981
2001	8	7	5	5	1,670	2	2	36	1,710
2002	12	7	5	3	1,321	4	1	0	1,326
2003	13	6	6	3	1,143	2	8	9	1,162
2004	11	4	5	4	2,125	15	0	8	2,148
2005	17	14	7	5	1,643	13	1	18	1,675
2006	13	10	6	4	1,070	6	3	2	1,081
2007	18	12	5	3	3,094	6	3	4	3,107
2008	16	10	3	2	585	9	2	1	597
2009	28	17	5	3	2,708	28	21	11	2,768
2010	27	19	7	4	2,088	33	13	13	2,147
2011	25	20	5	5	981	17	1	0	999
2012	15	10	2	2	648	8	0	0	656
2013	25	19	5	5	1,259	10	0	18	1,287
2014	19	12	5	3	697	19	0	20	736
2015	15	10	4	4	664	6	1	2	673
2016	25	14	8	2	959	14	0	6	979
2017	26	11	10	5	1,208	2	1	14	1,225
2018	42	25	8	3	6,981	12	0	156	7,149
2019	44	33	6	2	6,250	7	1	6	6,264
Average 2014–2018	25	14	7	3	2,102	11	0	40	2,152
Average 2009–2018	25	16	6	4	1,819	15	4	24	1,862

^a Reported harvest is from set gillnets with the following exceptions: 202 whitefish (WF) were harvested with a seine in 2000, 5 WF and 5 burbot (BB) in 2003, 52 WF in 2006 with fyke nets, and 12 WF and 1 BB by spear in 2011.

^b Retention of species other than whitefish or longnose suckers taken with gillnets was prohibited by permit stipulation beginning in 2011. Species other than whitefish listed as harvested after 2010 were not retained and were released either dead or alive.

FIGURES

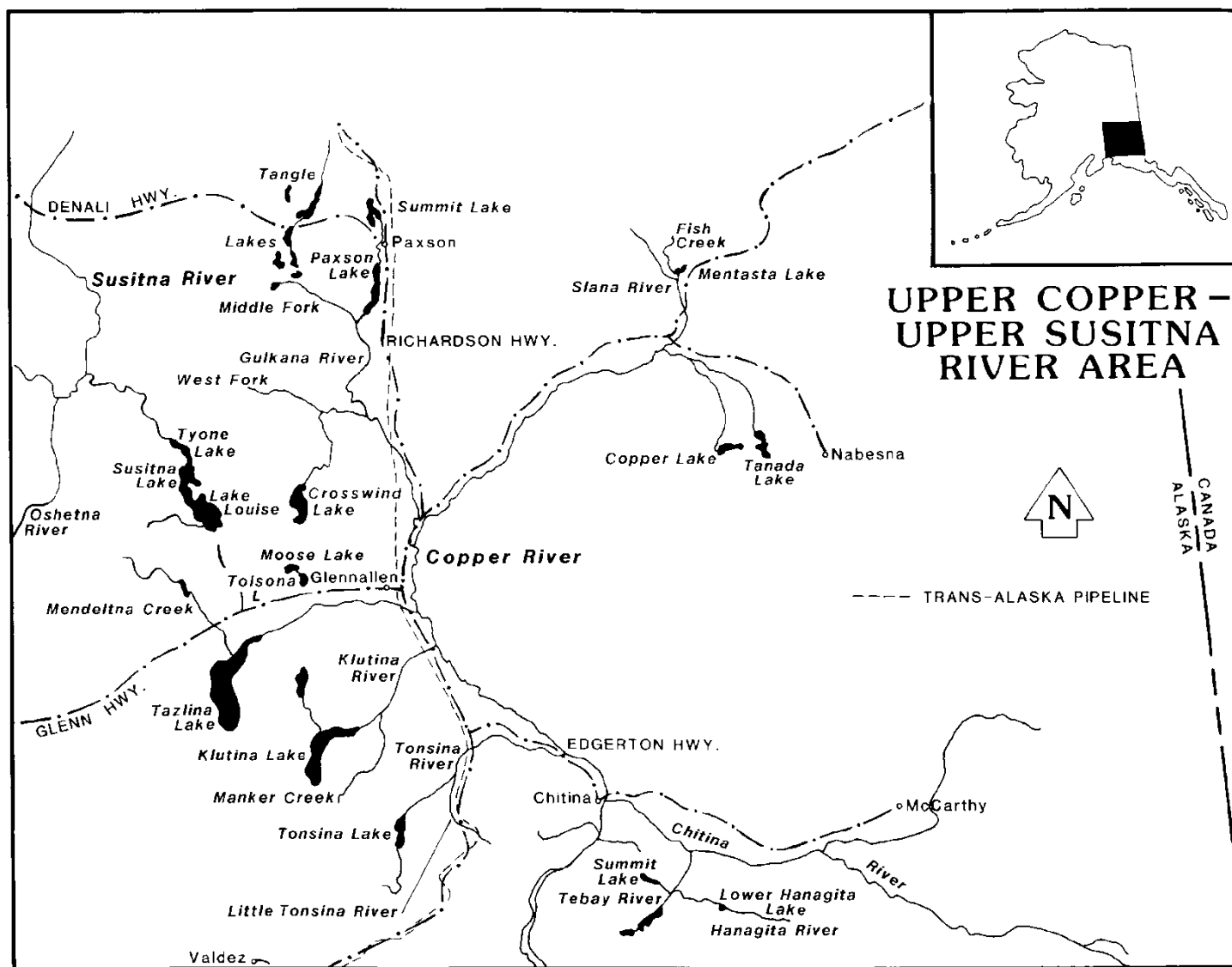


Figure 1.—The Upper Copper/Upper Susitna Management Area (UCUSMA).

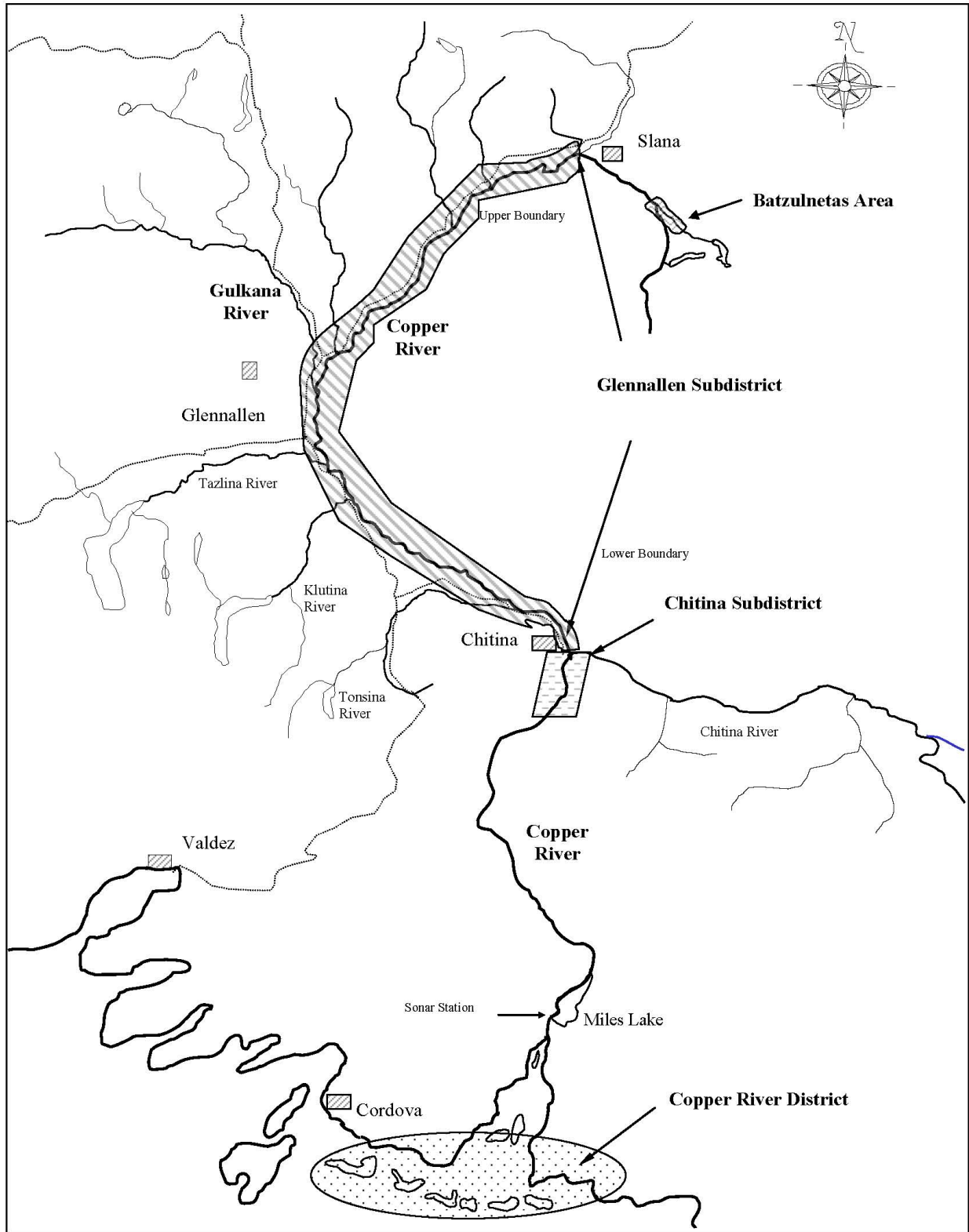


Figure 2.—Upper Copper River fishery subdistricts and areas.

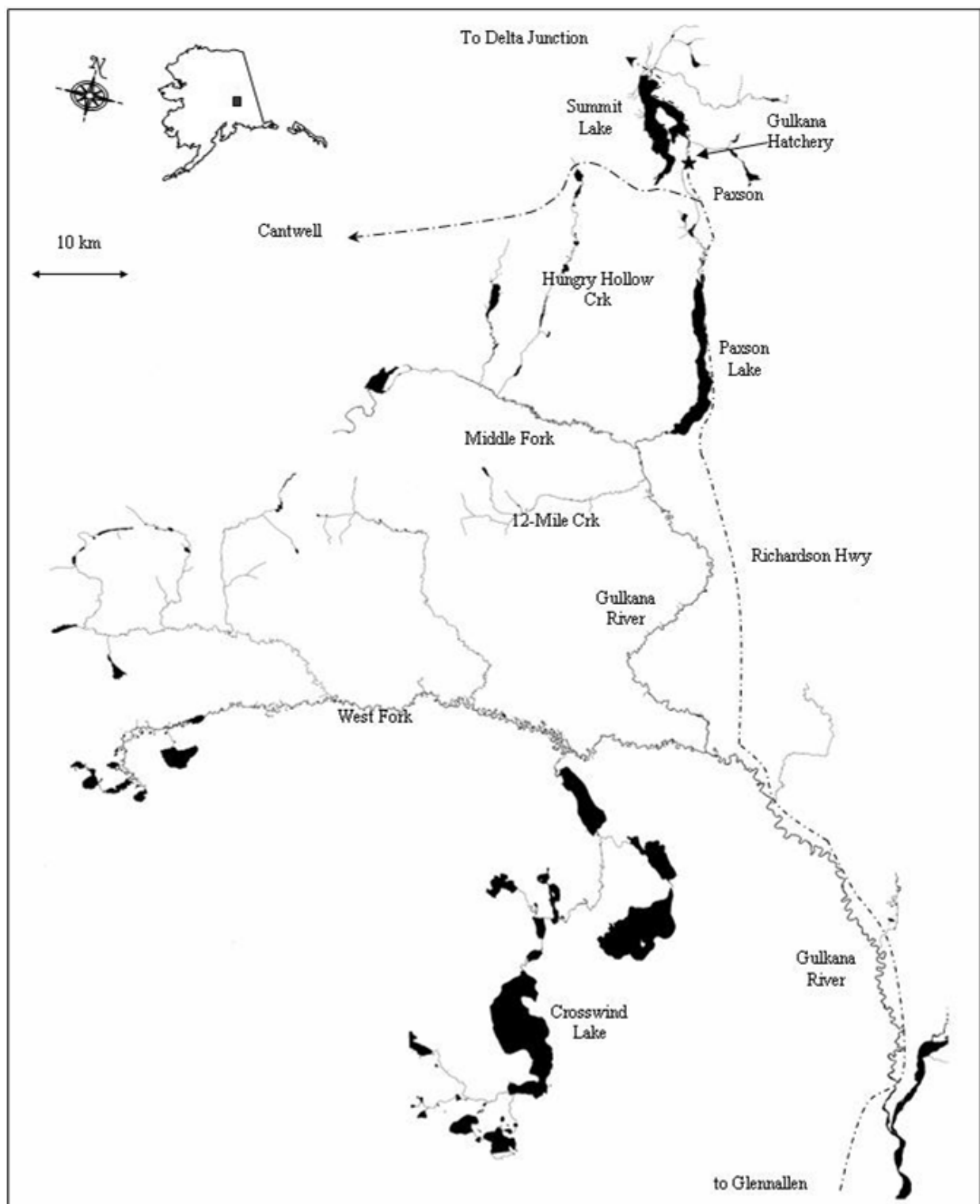


Figure 3.—Gulkana River drainage

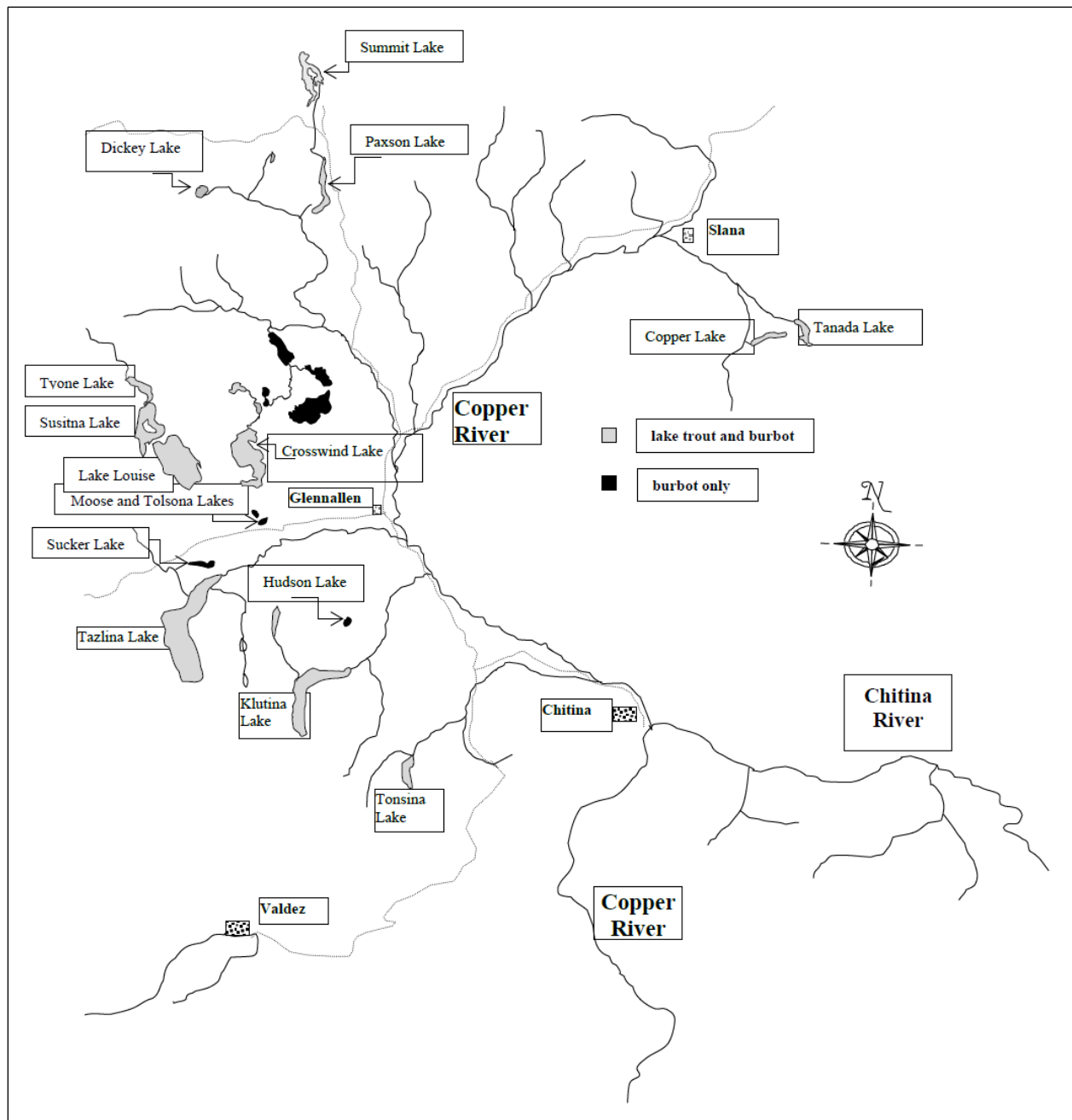


Figure 4.—Upper Copper Upper Susitna Management Area lake trout and burbot fisheries.

APPENDIX A: EMERGENCY ORDERS

Appendix A1.–Emergency orders (EO) issued for Upper Copper/Upper Susitna Management Area (UCUSMA) sport, personal use, and subsistence fisheries during 2019 and 2020.

Year	EO Number	Explanation
2019	3-RS-I-01-19	Establishes the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River through August 31, 2019, and opens the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for a 72-hour period beginning June 7, 2019. The Chitina Subdistrict of the Upper Copper River District will be open from 12:01 a.m. Friday, June 7 through 11:59 p.m. Sunday, June 9.
2019	3-RS-I-02-19	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of June 10, 2019. The Chitina Subdistrict will be open from 12:01 a.m. Monday, June 10 through 11:59 p.m. Sunday, June 16, 2019.
2019	3-RS-I-03-19	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of June 17, 2019. The Chitina Subdistrict will be open from 12:01 a.m. Monday, June 17 through 11:59 p.m. Sunday, June 23, 2019.
2019	3-RS-I-04-19	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of June 24, 2019. The Chitina Subdistrict will be open from 12:01 a.m. Monday, June 24 through 11:59 p.m. Sunday, June 30, 2019.
2019	3-RS-I-05-19	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of July 1, 2019. The Chitina Subdistrict will be open from 12:01 a.m. Monday, July 1 through 11:59 p.m. Sunday, July 7, 2019.
2019	3-RS-I-06-19	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of July 8, 2019. The Chitina Subdistrict will be open from 12:01 a.m. Monday, July 8 through 11:59 p.m. Sunday, July 14, 2019.
2019	3-RS-I-07-19	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of July 15, 2019. The Chitina Subdistrict will be open from 12:01 a.m. Monday, July 15 through 11:59 p.m. Sunday, July 21, 2019.
2019	3-RS-I-01-19	Liberalizes the sport fish bag and possession limit in the Copper River drainage for sockeye salmon 16 inches or longer. Beginning 12:01 a.m. Saturday, July 20, 2019, the limit for sockeye salmon in the Copper River drainage is six fish per day, six in possession.
2019	3-RS-I-08-19	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of July 22, 2019. The Chitina Subdistrict will be open from 12:01 a.m. Monday, July 22 through 11:59 p.m. Sunday, July 28, 2019.

-continued-

Year	EO Number	Explanation
2019	3-RS-I-09-19	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of July 29, 2019. The Chitina Subdistrict will be open from 12:01 a.m. Monday, July 29 through 11:59 p.m. Sunday, August 4, 2019.
2019	3-RS-I-10-19	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period of August 5–31, 2019. The Chitina Subdistrict will be open from 12:01 a.m. Monday, August 5 through 11:59 p.m. Saturday, August 31, 2019.
2020	3-RS-I-01-20	Establishes the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River through August 31, 2020 and opens the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for a 24-hour period on June 7, 2020. The Chitina Subdistrict of the Upper Copper River District will be open from 12:01 a.m. Sunday, June 7 through 11:59 p.m. Sunday, June 7.
2020	3-RS-I-02-20	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of June 8, 2020. The Chitina Subdistrict will be open from 12:01 a.m. Thursday, June 11 through 11:59 p.m. Sunday, June 14, 2020.
2020	3-RS-I-03-20	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of June 15, 2020. The Chitina Subdistrict will be open from 12:01 a.m. Thursday, June 18 through 11:59 p.m. Sunday, June 21, 2020.
2020	3-KS-I-03-20	Reduces the sport fish annual limit for king salmon 20 inches or greater in length in the Upper Copper River drainage. Beginning 12:01 a.m. Saturday, June 20, 2020, the annual limit for king salmon in the Copper River drainage is one fish. Any king salmon harvested from the Upper Copper River drainage prior to June 20 does not count toward the one fish annual limit.
2020	3-RS-I-04-20	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of June 22, 2020. The Chitina Subdistrict will be open from 12:01 a.m. Monday, June 22 through 11:59 p.m. Monday, June 22 and open from 6:00 a.m. Wednesday, June 24 through 11:59 p.m. Sunday, June 28, 2020. In addition, this emergency order closes the Chitina Subdistrict Personal Use Dip Net Salmon Fishery to the retention of king salmon. King salmon incidentally taken may not be retained and must be released immediately and returned to the water unharmed.
2020	3-RS-I-05-20	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of June 29, 2020. The Chitina Subdistrict will be open from 12:01 a.m. Monday, June 29 through 11:59 p.m. Sunday, July 5, 2020.

-continued-

Year	EO Number	Explanation
2020	3-RS-I-06-20	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of July 6, 2020. The Chitina Subdistrict will be open from 12:01 p.m. Thursday, July 9 through 11:59 p.m. Sunday, July 12, 2020.
2020	3-RS-I-07-20	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of July 13, 2020. The Chitina Subdistrict will be open from 12:01 p.m. Thursday, July 16 through 11:59 p.m. Sunday, July 19, 2020.
2020	3-RS-I-08-20	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of July 20, 2020. The Chitina Subdistrict will be open from 12:01 a.m. Friday, July 24 through 11:59 p.m. Sunday, July 26, 2020.
2020	3-RS-I-09-20	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the week of July 27, 2020. The Chitina Subdistrict will be closed from 12:01 a.m. Monday, July 27 through 11:59 p.m. Sunday, August 2, 2020.
2020	3-RS-I-10-20	Amends the schedule for the personal use dip net salmon fishery in the Chitina Subdistrict of the Upper Copper River for the period of August 3–31, 2020. The Chitina Subdistrict will be closed from 12:01 a.m. Monday, August 3 through 11:59 p.m. Monday, August 31, 2020.
2020	3-RS-I-01-20	Closes all waters of the Upper Copper River drainage upstream of the south bank of Haley Creek to sport fishing for sockeye salmon, effective 12:01 a.m. Monday, August 3, 2020. Sockeye salmon may not be taken or possessed and must be released immediately.

APPENDIX B: FEDERAL SUBSISTENCE PERMITS

Appendix B1.—Federal subsistence permits and harvest from the Copper River, Glennallen Subdistrict, 2002–2019.

Year	Permits issued	Permits fished	Estimated harvested				
			King	Sockeye	Coho	Steelhead	Other
2002	201	107	564	7,950	81	62	0
2003	221	127	554	13,616	152	5	0
2004	262	148	636	17,704	152	12	0
2005	267	197	389	21,927	187	0	41
2006	254	170	460	18,346	28	15	71
2007	281	224	663	17,624	57	9	122
2008	270	139	837	14,475	229	26	52
2009	274	170	543	13,668	34	19	110
2010	269	175	326	14,137	81	42	62
2011	277	173	743	15,753	223	5	317
2012	275	169	415	16,487	173	42	106
2013	273	160	374	17,060	21	7	88
2014	315	206	420	23,034	29	10	59
2015	325	210	402	26,896	78	7	201
2016	320	171	396	19,365	11	7	368
2017	332	212	431	16,251	1	7	533
2018	335	199	3,137	16,734	0	4	46
2019	343	209	886	16,130	0	1	53
Average 2014–2018	325	200	957	20,456	24	7	241
Average 2009–2018	300	185	719	17,939	65	15	189

Note: Reported harvest only 2002–2004; expanded harvest (estimates include harvest from non-returned permits) after 2004.

Appendix B2.—Federal subsistence permits and harvest from the Copper River, Chitina Subdistrict, 2002–2019.

Year	Permits issued	Permits fished	Estimated harvested				
			King	Sockeye	Coho	Steelhead	Other
2002	122	ND	33	575	0	0	0
2003	100	ND	18	717	70	0	0
2004	109	ND	7	1,215	18	0	0
2005	76	27	51	2,450	0	0	0
2006	75	29	18	1,549	20	0	0
2007	98	74	28	1,028	41	0	0
2008	82	38	23	959	100	0	0
2009	68	39	9	882	11	0	0
2010	92	38	18	2,324	30	0	0
2011	85	42	13	1,933	10	0	0
2012	90	33	5	915	8	8	0
2013	99	39	18	2,252	8	2	10
2014	113	49	14	1,664	69	10	0
2015	111	52	15	2,345	14	7	0
2016	128	43	15	1,321	11	0	4
2017	132	47	12	1,600	8	0	0
2018	131	58	101	3,491	34	0	0
2019	181	90	78	4,210	20	0	0
Average 2014–2018	123	50	31	2,084	27	3	1
Average 2009–2018	105	44	22	1,873	20	3	1

Note: Reported harvest only 2002–2004; expanded harvest (including estimated harvest from non-returned permits) after 2004.